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COMPUTERWORLD

Apple pushes lead in PowerPC arena

By Mark Halper

While IBM fiddles with its PowerPC decision-making, Apple Computer, Inc. continues to blaze a technology trail. Last week it unveiled the first of several new products planned through mid-1995.

In a move well received by users always interested in faster hardware, Apple ratcheted up the speed of its Power Macintosh line by adding a 110-MHz version to the high-end Model 8100. The box offers a nearly 40% boost in raw processor performance over the 80-MHz model.

The company will follow that act next week at Comdex/Fall '94 with the introduction of a 33-MHz 486SX add-in board for the Power Macintosh [CW, Aug. 8]. The board will provide faster

Apple, *page 15*

Dream team

Sources said IBM and Apple will announce today a common hardware platform for the PowerPC. The firms hope their design alliance will ensure the unified processor's acceptance in the market.

TCP/IP gains equal footing on PC LANs

By William Brandel and Suruchi Mohan

To IP or not to IP? That is the question.

Facing increasing pressure from LAN-locked users who are demanding direct access to corporate networks and data, officials at Novell, Inc. last week said they will deliver an industry-standard TCP/IP stack for the soon-to-be-released NetWare 4.1.

The move underscores a user shift away from Novell's proprietary IPX/SPX protocol toward a more industry-standard transport protocol. It also highlights increased use of the Internet and a growing demand for wide-area access to mainframes and Unix servers.

And perhaps dangerously for Novell, giving equal footing to TCP/IP provides Microsoft Corp. with its best opportunity yet for breaking Novell's grip on the LAN market.

"As it now stands, Microsoft's TCP/IP implementation gives it a chance to level the networking playing field against Novell," said Dan Lynch, chairman of the Interop conference and trade show in Foster City, Calif.

Source: Forrester Research, Inc., Cambridge, Mass.

Loss of control

By embracing an open industry standard, Novell will no longer strictly control the development of the transport protocol on NetWare, as it does with IPX/SPX.

Other events have coincided to push Novell to give TCP/IP equal access on its LANs. First, new TCP/IP technology championed by Microsoft — virtual device drivers, or VXD, that run under Windows — gives TCP/IP stacks better performance on LANs. Also, a new management protocol, Dynamic Host Configuration Protocol, promises to eliminate many of the management nightmares associated with TCP/IP addresses.

VXDs are considered superior to the existing terminate-

TCP/IP, *page 16*

Object projects pick up

By Melinda-Carol Ballou and Ellis Booker

Momentum is building behind key object technology standards, as evidenced last week by a flurry of major government contract awards. Yet even more compelling is the growing commitment to object technology among users.

The Advanced Research Projects Agency recently awarded a $24 million Technology Reinvestment Program, a two-year grant to encourage the creation of distributed object technologies for commercial and military use. Led by Andersen Consulting, the team of companies chosen by ARPA includes Raytheon Corp., the University of Maryland, Expersoft Corp. and others.

The National Institute of Standards and Technology announced two grants, one to create de facto

Objects, *page 143*

PowerBuilder issues mount

By Rosemary Cafasso and Melinda-Carol Ballou

These days, many Powersoft Corp. users find that stealing programming techniques from the disciplined world of mainframes is their best bet for developing industrial-strength client/server applications with PowerBuilder.

On the eve of Powersoft's introduction of a new version of its popular PowerBuilder tool set, several high-end developers said last week they are using a variety of methods to bypass PowerBuilder's limitations. These shortfalls include a lack of support for three-tiered client/server architectures, some users said.

Users are also spending more time and money up front to get beyond PowerBuilder's learning curve rather than diving right into development.

Still others are creating hybrid systems that incorporate technology such as remote procedure calls to distribute applications.

Power to the people

Responding to this trend, Powersoft will announce this week at least two efforts to deliver more programming structure and discipline to users. First, PowerBuilder 4.0, to be announced today, will ship with sample applications and

PowerBuilder, *page 143*

Left for dead: But they're still ALIVE!

By Mary Brandel

Last seen drowning in their own red ink in the late 1980s, the struggling New England minicomputer makers have re-emerged with surprising vigor along Boston's Route 128.

Although recovering, they are barely recognizable. For the past six turbulent years, Data General Corp., Groupe Bull and Wang Laboratories, Inc. have cut, slashed and burned their way to new identities and new prospects for profitability.

SHIFTING STRATEGIES

Left in their wake are 53,105 laid-off workers and $2.4 billion in lost revenue. But growing revenue from PCs, field maintenance, Unix servers and even mainframes has resuscitated these once moribund companies.

Left for dead, *page 28*

RENOVATE

Instead of blowing away its multimillion-dollar mainframe investment, federal mortgage company Fannie Mae is integrating its 20-million-line Cobol systems with its more than 30 Unix-based client/server apps.

See In Depth, page 105.

TIM GRAJEK

[DON'T OBLITERATE]

Newspaper

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Sun to 'publish and subscribe' to tool kit

Deal with Teknekron extends capabilities across platforms

By Jean S. Bozman

Sun Microsystems, Inc. and Teknekron Software Systems, Inc. said last week they are planning to jointly market Teknekron's publish-and-subscribe distributed computing technology for enterprise applications.

Also last week, Teknekron released its Enterprise Toolkit, the cross-platform data modeling software and tool kit. An announcement about how the two firms will market the product and related services is expected by year's end, Teknekron Chief Executive Officer Vivek Ranadive said.

The firms have been business partners in Wall Street accounts for several years.

Publish-and-subscribe is a generic term for application development technology that tags specific types of data for inclusion in networked applications.

Already used by Microsoft Corp. and Apple Computer, Inc. for desktop applications, the publish-and-subscribe technology in Teknekron's Enterprise Toolkit will let event-driven data shuttle between applications and databases on a network without regarding the underlying operating systems.

In desktop applications, for example, one data field can be highlighted for use in a second or third application, typically in compound documents with text and graphics. But in distributed systems scattered over a network, items that are "published" can be broadcasted over a LAN or a WAN, then picked up automatically by other applications that "subscribe" to the data updates.

Practical use

On Wall Street, several vendors provide such data broadcasts to feed stock-price updates into desktop spreadsheets or complex financial-analysis applications.

"What publish-and-subscribe gives you is a virtual API between systems," said Jim Stikeleather, a partner at Technical Resource Connection in Tampa, Fla., an object-oriented systems consultant firm. "It's [like] a conference call, and you only listen to the things you want to listen to."

The Teknekron package uses a proprietary scripting language to create hand-off mechanisms that "publish" new data to the network and allow other applications to "subscribe" to that data. Workflow in the organization can be changed without modifying applications, but by tagging data for inclusion in multiple existing applications and databases.

The Chase Manhattan Bank NA in New York has been using Teknekron technology with several hundred Sun workstations in its worldwide trading operations for more than two years. Rupi Puri, head of global trading operations and systems at Chase, said the publish-and-subscribe software broadcasts data updates to trading rooms in New York, London, Tokyo, Milan and Paris.

Sun CEO Scott McNealy *says the technology is the antithesis of host-based centralized computing*

Using the software with conventional spreadsheet applications allows Chase traders to import timely updates to their desktops without dialing up the bank's Sybase, Inc. database servers with SQL queries.

"If we didn't have this technology, we'd have to keep building point-to-point links all the time," Puri said. Application development time is also trimmed, he added, because applications do not have to be modified to accommodate data broadcasting.

Major standards

Priced from $2,000 to $20,000, Teknekron's Enterprise Toolkit is compatible with the Object Management Group's Common Object Request Broker Architecture 1.1 and Interface Definition Language.

Industry analysts said publish-and-subscribe techniques have been available in proprietary forms for years, but open systems versions could finally make the concept of distributed object computing a commercial reality.

"The tool kit is taking a set of tools for building very high-capacity, real-time apps and packaging it as a product," said John Rymer, a senior analyst at the Patricia Seybold Group in Boston. "Previously, you had to hire Teknekron to come in and do this."

Key support

Sun CEO Scott McNealy endorsed the publish-and-subscribe technology last week and said it is an important way to divide corporate data processing as "strands" on an enterprise TCP/IP network. Sun's information systems department has used Teknekron's development tool kit for manufacturing projects [CW, Oct. 24].

"It is the antithesis of the host-based centralized mainframe model of computing," McNealy said. "You create an [on-line transaction processing] network, not an OLTP machine."

But the basic technology must be surrounded by industrial-strength security and data authentication before it can be a hit in the marketplace, McNealy cautioned.

Senior editor Rosemary Cafasso contributed to this story.

Database heavyweights

Teknekron's Enterprise Toolkit will be marketed as a shrink-wrapped product compatible with Unix servers, Windows PCs, Digital Equipment Corp.'s VAXs and IBM's MVS mainframes. It works with databases from Oracle Corp. and Sybase as well as with the Ingres database from Computer Associates International, Inc. Versions compatible with IBM's mainframe IMS and DB2 databases are set to be introduced in the first quarter of 1995.

GE pursues wireless for field-service edge

By Michael Fitzgerald

In the near future, wireless technology will mean you might not have to take the day off every time your washing machine breaks down.

In what is expected to become a major differentiator for the company, General Electric Co. is rolling out wireless terminals for RAM Mobile Data, Inc.'s Mobitex network to all the field service technicians in its consumer services group, according to sources close to both companies.

One of GE's main goals is to give its technicians the ability to schedule appointments with a scheduling application that allows an appliance owner to get a specific time of day for service.

Taking the field

A source close to the project said GE has outfitted 439 of its 1,600 field service technicians with AT&T Corp. Safari notebook computers set up to run over the Mobitex network. The company intends to outfit the rest by the end of next year.

"If they can manage appointment scheduling, that would be a big customer service differentiator," said Roberta Wiggins, an analyst at The Yankee Group in Boston. GE rival Sears, Roebuck and Co. had hoped to roll out a similar project this year, but it has been delayed due to network and hardware considerations. Sears is now looking at a start date of no earlier than the second quarter of next year [CW, Oct. 10].

Sources at RAM Mobile Data added that GE is also using the application for customer closeouts, updating parts records and repairing service trucks.

GE did not return phone calls but has said that the wireless technology, in its pilot testing stage, allows technicians to make two more calls a day than they can now. This works out to some 800,000 more calls per year.

Up and running

A source at one of GE's third-party partners confirmed the project rollout and told *Computerworld* that GE has a database running on a Hewlett-Packard Co. HP 9000 in its Louisville, Ky., facility. GE used Microsoft Corp.'s Visual Basic to build the client application to synchronize with the database, the source said, adding that GE has stopped talking about the application because it considers it a strategic differentiator.

As a side note, GE has an unusual number of divisions looking at wireless projects. Currently, five GE units use RAM Mobile Data wireless, either commercially — such as GE Computer Services, with 40 users — or as a pilot. At pilot users GE Capital Fleet Services, GE Capital Mortgage and GE Medical, the projects are in the early stages and involve fewer than 10 users each, a source at RAM Mobile Data said.

Dynamic RAM

RAM Mobile Data continues to grow rapidly, though from a minuscule base:

	Second quarter 1994	Third quarter 1994
Number of users	12,000	17,000
Percent of population covered	90%	92%
Metropolitan statistical areas covered	216	238
Cities and towns covered	7,500	7,700

RAM Mobile Data network grows up. See page 12.

Corrections

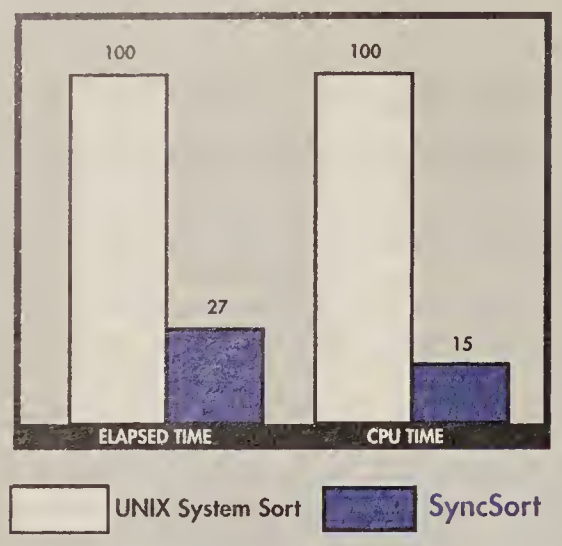
Due to a reporting error in the Oct. 24 issue, Kenan Technologies and its product Acumate were both incorrectly spelled.

A chart accompanying a story in the Oct. 24 issue, "Microsoft sails ODBC through other ports," incorrectly stated the number of vendors with Open Database Connectivity drivers or applications. The total is 130.

The Internet finger command address for TV Ratings, which was listed in the Oct. 17 WYSIWYG, is no longer available. The address for Bad Pun of the Week should read "finger drics@nyx.cs.du.edu."

The UNIX System Sort

PERFORMANCE



FUNCTIONS

	UNIX System Sort	SyncSort
RECORD FORMATS		
Fixed length binary	NO	**YES**
Variable length binary	NO	**YES**
ASCII Text	YES	**YES**
RECORD PROCESSING		
Selection	NO	**YES**
Reformatting	NO	**YES**
Summarization	NO	**YES**
Grouping	NO	**YES**
COLLATING SEQUENCES		
Standard ASCII	YES	**YES**
EBCDIC	NO	**YES**
User Defined	NO	**YES**
Multi-byte	NO	**YES**

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OSF offers peek at DCE 1.2

By Craig Stedman
NEWTON, MASS.

As the Open Software Foundation (OSF) gave a public send-off to Release 1.1 of its Distributed Computing Environment (DCE) software last week, users got a private look at coming attractions. The show-and-don't-tell session included a promise that the next version of DCE will be integrated with Novell, Inc.'s NetWare and Sun Microsystems, Inc.'s rival distributed computing scheme.

Due late next year, DCE 1.2 will also support single-threaded applications and "slim" 486-based clients with 8M bytes of memory, according to a document given to users at an OSF meeting here. New security and administration features are planned as part of an attempt to get DCE in shape for prime-time deployment across enterprises (see chart).

Future perfect

DCE 1.2 will include the following enhancements when it ships late next year:

- NetWare and ONC interoperability
- Support for public key-encryption mechanisms
- Compatibility with standard MIT Kerberos Version 5 user authentication protocol
- An agent that allows SNMP-based management tools to query DCE systems
- Naming service compliant with X/Open Federated Naming programming interface

Limited appeal

DCE is a middleware technology that enables applications to be distributed across multiple platforms from PCs to mainframes. But even DCE vendors concede that the lack of NetWare interoperability limits its appeal. "That causes some people to have second thoughts" about implementing DCE, said Rich Wilkie, manager of Hewlett-Packard Co.'s DCE program.

Users who heard the DCE 1.2 pitch said the future release — the first being planned by a group of vendors instead of the OSF staff — should be a useful addition to the just-shipped Release 1.1 [CW, Oct. 31].

DCE 1.1 provides most of the tools needed to develop distributed applications, "but you've still got NetWare and other things to deal with," said Charles Blauner, lead security consultant at Bellcore in Piscataway, N.J. "Based on the glimpses we've seen of 1.2, it will help push [DCE] out more and more."

"I think what [the 1.2 team] ended up with will be a big step forward," agreed William Estrem, a project leader in the information architecture department at 3M Co. in St. Paul, Minn. "You can say that 1.1 will be adequate to meet 75% of our needs. Then I think 1.2 will provide the next 15% to 20%."

Estrem, who represents the OSF end-user steering committee on the DCE 1.2 project, said the technology plan still could be changed because of user feedback or ongoing negotiations between the vendors. But he added that he sees "no showstoppers" missing from the proposed contents.

According to the DCE 1.2 overview document, NetWare 3.x and 4.x clients will be able to access the DCE Distributed File System using standard NetWare or Windows application programming interfaces and commands. Utilities and a NetWare Loadable Module will also be included for managing and synchronizing user accounts across both environments.

DCE 1.2 will also embrace Sun's Open Network Computing (ONC) technology, a competing product suite for distributed computing. Mechanisms will be provided to synchronize passwords and group maps of users between DCE and ONC, the document said.

The vendors involved in the DCE 1.2 project — HP, Digital Equipment Corp., Hitachi Ltd. and IBM and its Transare Corp. subsidiary — had hoped to finalize plans and sign joint development agreements last month, Wilkie said. But it will likely take an extra four to six weeks to resolve all of the legal issues, he added.

OMG vote stalls DCE progress. Page 81.

'Bridge' bolsters Notes Express

By Lynda Radosevich

Tiny tools vendor Brainstorm Technologies, Inc. aims to make it cheaper and easier for Notes sites to get around the limitations of Lotus Development Corp.'s recently announced Notes Express.

Notes Express, a subset of Notes priced at $60 to $99 per user, is limited to running the five prebuilt Notes applications. Many Notes sites have complained because Express cannot be used to create additional Notes applications or access those programs created using the full-blown Notes built-in development capabilities. However, the Express license has a price-saving caveat that Brainstorm seeks to help developers exploit (see chart).

Steve Kobbs, president of Collective Energy Corp., a Notes application development company in Houston, said, "Companies have millions of dollars invested in custom [Notes] applications that were developed in the Notes environment. They thought Express would be a cost-effective way to distribute them." But the Express discount does not work unless users build their own front ends via the Notes application programming interface (API), he said.

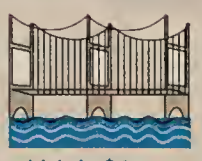
Last week, Cambridge, Mass.-based Brainstorm announced VB/Link Desktop for Notes, a $149 set of Visual Basic Controls for Notes. When used with graphical programming environments such as Microsoft Corp.'s Visual Basic, it is a much easier way to write to the Notes API than using the C-level programming that would otherwise be necessary, according to Mitch Liu, chief technology officer at Brainstorm.

With VB/Link Desktop, Brainstorm especially targets mobile and remote Notes users who dial in to corporate Notes databases and exchange updates between their Notes applications and Notes applications on the corporate server, he added.

VB/Link Desktop is a lower-cost version of Brainstorm's $795 server version of VB/Link.

SmartSuite for OS/2 debuts. Page 57.

How a VBX helps Notes developers



- Lotus allows developers to create custom applications that access the Notes document database and distribute the client software for the cost of Notes Express, which is $60 to $94. Full Notes costs $495 per user. But developers have to use C-level programming to write to the Notes application programming interface, which is a complex task.
- If, however, they use a Notes VBX, such as Brainstorm's VB/Link, and a graphical development environment, such as Microsoft's Visual Basic, the development process will be simplified.

Novell eyes '95 ship for SMP Unix 2.0

By Jean S. Bozman
HILTON HEAD, S.C.

Hoping to recapture the momentum it lost in the Unix market this year, Novell, Inc. last week announced an early 1995 release for the symmetrical multiprocessing (SMP) version of its UnixWare 2.0 operating system.

Conceding past marketing blunders, top Novell executives gathered here last week to unveil plans to increasingly merge components of UnixWare and NetWare by 1996.

"Unix is the fortified hill that [Microsoft Corp.'s Windows] NT is trying to conquer," Novell Chief Executive Officer Robert Frankenberg said. "One of the things that isn't right is that Unix isn't unified. We're going to work with our partners to address that shortcoming."

Those partners include desktop vendors such as Compaq Computer Corp. and Unix System V source-code licensees such as Unisys Corp. and AT&T Global Information Solutions.

Shipment of UnixWare 2.0 to Novell's channel partners is expected in December, with a multiproduct announcement about UnixWare, NetWare 4.1 and WordPerfect set for January. The initial release of UnixWare 2.0, aimed directly at the Intel Corp. multiprocessor server market, will take on Windows NT and IBM's OS/2 as well as Unix-on-Intel rivals SCO Unix from The Santa Cruz Operation and SunSoft, Inc.'s Solaris 2.4, executives said.

Frankenberg also set more distant targets for future releases of UnixWare 2.1 late next year and the announcement of UnixWare 3.0 — with extensive links to NetWare — in 1996.

UnixWare features

- An initial UnixWare 2.0 release that supports up to four CPUs but can be extended to eight or more with software upgrades. Built-in support for Novell's IPX/SPX protocol and TCP/IP.
- A 1995 release of UnixWare 2.x servers will support NetWare directories.
- A 1996 release, called UnixWare 3.0, that is built on a modified Chorus Systems microkernel and supports clustering and a single-system image.

Starting over

With the SMP version, Novell is essentially relaunching UnixWare. The networking vendor shipped only 35,000 copies of its UnixWare 1.x operating system last year, although company officials said shipments more than doubled this year. The goal is to ramp up to 100,000 to 150,000 unit sales.

Novell will market Intel versions directly to large information systems sites and through NetWare channels. Novell said RISC microprocessor versions of UnixWare 2.0 will be ported from the Intel version by some of its OEM vendors.

At least one UnixWare 1.1 user said he was heartened by Novell's plans to develop the product further.

"I want anything we build to be upgradable and scalable, so the fact that it's an SMP server is essential," said Richard J. Kish, vice president of information technology at Waldenbooks, Inc. in Stamford, Conn. He said he favors UnixWare 2.0's improved ease of use and graphical administration functions for field use.

Kish is putting pilot UnixWare 1.1 servers on Intel-based uniprocessors from Unisys in six bookstores nationwide. The store servers will relay point-of-sale data to relational databases running on Hewlett-Packard Co.'s Unix servers at headquarters.

The SMP version of UnixWare marks Novell's return to the Unix application server arena. "They've rediscovered the classic Unix business," said Nina Lytton, president of Open Systems Advisors in Boston. "They have an appreciation of what Unix can add to the Novell empire rather than a sense of threat."

But some analysts argued that Novell must protect Unix features that may be overshadowed by NetWare technology.

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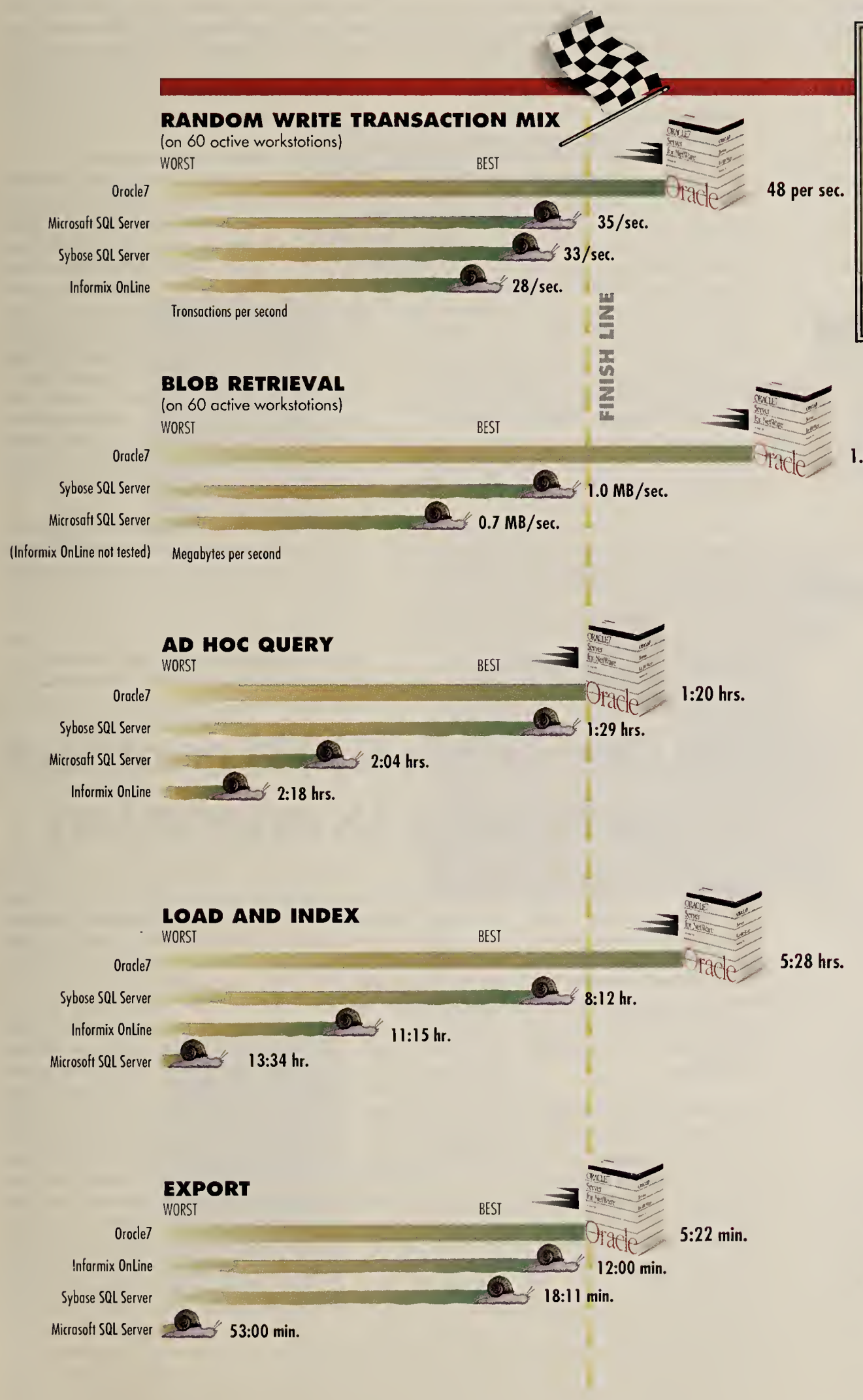

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ORACLE

Object developers should think Small

An IS shop moving into object-oriented development must first decide on a language. And while there are several candidates, in many cases Smalltalk is the logical choice for the job.

I'm not looking to restart any language wars here. If you like developing in C++, don't bother reading any further. But if you want the full advantage of moving to an object-oriented environment, then Smalltalk is for you. And if you want to modify your systems on the fly, then Smalltalk stomps the competition.

A few other languages — very few — have Smalltalk's dynamic characteristics, and Objective C and Common Lisp Object System (CLOS) deserve consideration, too. But Smalltalk is more mature, having been created in 1979 by Alan Kay & Co. at Xerox PARC, Xerox's Palo Alto Research Center in California. And it is available from Digitalk, ParcPlace Systems and IBM.

Compared with C++, Smalltalk is a simpler and more rigorous object-oriented development environment. Both languages support the object-oriented quality of inheritance, but with Smalltalk, a subclass of objects inherits characteristics from a single class above it. With C++, a subclass may inherit from multiple classes, leading to greater flexibility and greater complexity. The latter often causes trouble even for experienced developers.

The Meta View

Compared with C++, Smalltalk is a simpler and more rigorous object-oriented environment.

Charles Babcock

"C++ lets you do all sorts of horrible things that you don't even realize you're doing," says James Odell, co-author of the Martin/Odell methodology for object-oriented development.

Smalltalk forces more object-oriented discipline on the programmer. If you have a shop of Cobol or Fortran programmers, you will face a large hurdle in getting them to accept the precepts of object-oriented programming. It is hard enough to get 20-year-veteran sequential code writers to think in terms of discrete objects organized around polymorphism and inheritance. Better to throw a straightforward set of Smalltalk rules at them than befuddle everyone with the convolutions of C++. It takes Cobol programmers three months to learn Smalltalk, Odell says, but it takes a year for them to learn C++.

In addition, Smalltalk is a language for building large business systems. Existing mainframe applications frequently contain a set of business rules, and Smalltalk is a good vehicle for capturing the rules and entities of the legacy system in a new application.

Worthwhile change

But a crucial Smalltalk strength in the long run is its dynamic quality. A change can be made to a Smalltalk class library, changing an object, and that modification will be adopted for the next run of the system. There is a performance penalty, but it's not the same hit that occurs when a line of C or C++ code is modified, where you go on break while the compiler redoes the entire application.

Smalltalk functions more like Basic or other interpretive languages. If you add a line of Basic and issue the Run command, you get an execution of the program with the new line incorporated.

Smalltalk is different from interpretive languages, however, in that it doesn't need to run each line of code through an interpreter. Instead, it checks for changes in the underlying class libraries, compiles only the changes and then is ready to execute a runtime version. This takes a little more time than running compiled C++ code, but the trade-off is the dynamic adaptability of a Smalltalk production system.

If the business environment changes, the rules or objects in the Smalltalk application can change. And what could be more likely in today's business climate than changing conditions?

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Novell plans Telephony 2.0

Release enhances platform support but remains pricey

By Suruchi Mohan and William Brandel

Last week, Novell, Inc. announced that Version 2.0 of its NetWare Telephony Services will be released next April. However, while this release features greatly enhanced support for platforms and from private branch exchange (PBX) vendors, it still remains pricey and therefore out of reach for many users.

In Telephony 2.0, Novell has partnered with about two dozen PBX switch vendors — AT&T Corp. chief among them — to provide the drivers that let NetWare servers communicate with PBXs. The product offers Computer Supported Telecommunications Application compliance, which lets developers take advantage of a standard that dictates the way a computer talks to a PBX.

Before year's end, Novell will deliver the software developer's kits for NEST.

While applauding Novell's garnering of support for the product as well as the new features, many users noted that the technology is still costly for LAN-based telephony systems.

A physical link connects the server and the PBX. AT&T calls this the Applications System Asynchronous Interface link, which alone costs between $5,000 and $10,000.

Novell's current telephony strategy is based on Computer Telephony Integration (CTI), a client/server architecture for integrating desktop computers with telephones and PBXs. It involves setting up a logical connection between the desktop computer and the telephone that lets the end user manage calls.

However, Novell is working on plans to provide a better alternative to CTI in the not-too-distant future. Before year's end, Novell will deliver the software developer's kits for its Novell Embedded System Technology, or NEST. According to Novell officials, NEST will eliminate the need for special drivers and special hardware and will provide a direct connection to NetWare. In summary, it will overcome the hardware and networking bottlenecks now tied to CTI.

High marks overall

For now, the new version of Telephony is a clear improvement over Version 1.0. It supports a much wider selection of client environments, including Macintosh, OS/2, Windows NT and Novell's UnixWare operating systems. Novell's directory services and bulk administration of databases are also supported so user and extension lists can be imported directly into the database.

Overall, users contacted gave Novell's telephony services high marks for performance and the addition of new features. "That's a real time-saver in big shops," said Dennis Gerrity an MIS director at the law firm of Stinson, Mag & Fizzell in Kansas City, Mo.

However, he noted that the cost of upgrading to Release 2.0 will be high. "In an AT&T environment, to take advantage of all the Release 2.0 features, we will have to upgrade to the Definity G3 [switch], Version 4.0," Gerrity said.

Ambitious users are already experimenting with computer-integrated telephony. See page 63.

CSC receives $30M contract to run Scott's IS operation

By Julia King

The ever-shrinking Scott Paper Co. last week farmed out all information systems operations to Computer Sciences Corp. (CSC) under an unusually short one-year outsourcing contract worth $30 million.

Under the agreement, CSC in El Segundo, Calif., will assume responsibility for central computing and new applications development, which Scott estimates will save the company $3 million annually.

"We're in a rather dynamic state and didn't figure we could enter into an extended contract," said Jack Dailey, vice president of logistics, distribution and procurement at the Philadelphia-based papermaker. "We're changing our profile significantly."

Scott has been aggressively downsizing since last January in an effort to concentrate on its core paper tissue and towel business. Cost-cutting tactics so far have included reducing corporate staff by 70%, selling off the company's 55-acre headquarters campus and outsourcing several other corporate functions, including payroll and compensation and benefits. On the technology side, in August, Scott terminated 20% of its IS staff, including former IS chief Donald Shump [CW, Aug. 22].

Great Scott

In January, Scott announced it would cut 8,300 jobs over three years. Six months later, it accelerated that schedule, saying it would cut 10,500 workers companywide by the end of the year.

Under last week's deal, Scott's remaining 115 IS staffers will be offered employment at CSC. They will continue to serve the same internal Scott customers from the same locations, the companies said.

CSC acquires no physical assets as part of the contract. Next month, Scott's data center activities will be transferred to a CSC data center in Carlstadt, N.J.

"The uniqueness of this deal is that it's for one year, but it is our intent to enter into long-range plans," Dailey said.

The contract includes two additional one-year options, and it has provisions for negotiating a 10-year agreement at a future date.

Scott considered bids from several other outsourcing companies, including Electronic Data Systems Corp. and IBM, but not all would agree to the one-year trial period, he said.

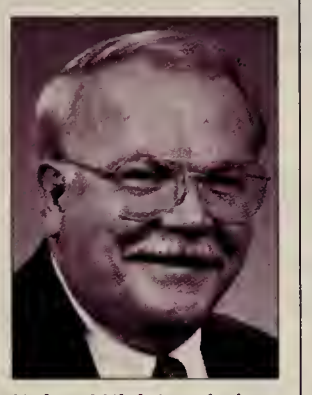
Unisys to ship parallel boxes in mid-1995

By Thomas Hoffman

Since announcing its parallel processing initiatives with Intel Corp. in August 1993, Unisys Corp. has kept a tight lid on its development efforts. Even its largest customers and the industry's closest observers were kept in the dark.

But as the Blue Bell, Pa., computer maker draws closer to the May 1995 debut of its scalable parallel processing (SPP) systems, the company's technical and marketing strategies are beginning to emerge.

By mid-1995, Unisys officials confirmed they will begin shipping the first of their 8-, 16-, 32- and 64-node Pentium-based systems. The Unix-based SPP systems will house a web of 6- and 60-MHz Pentium processors.



Unisys' Nick Derchak *says SPP prices will be competitive*

Unisys' SPP systems are extensions of Intel's Paragon supercomputers, which to date have been targeted at scientific and technical markets. Unisys is retaining some Intel technology, such as the mesh interconnect technologies that prevent performance degradation when processors are added.

But in other instances, Unisys has added value to the Intel systems by removing some of the barriers that hampered commercial acceptance of massively parallel processor (MPP) systems.

For example, future users of Unisys' SPP machines will not have to "parallelize" Unix workstation applications to run on the machines, according to Victor Velivis, business manager of Unisys' SPP division in Salt Lake City. This capability is made possible by an application programming interface written for the Unix operating system that provides a single-system image to the applications.

That's the ticket

Offering a single-system image could be a key competitive differentiator for Unisys, analysts said. "Shielding users from the complexity of these systems is the greatest challenge that all of these [MPP] vendors face," said Christopher Willard, manager of high-performance technologies at International Data Corp. in Mountain View, Calif.

Unisys said it intends to target the systems first at its installed base of customers, where the vendor has a strong presence in the public sector, transportation, telecommunications and financial services markets.

Nick Derchak, director of Unisys' SPP division, declined to outline pricing for the new systems, although he said they would be "competitive" in the market.

Low-end MPP systems from competitors such as AT&T Global Information Solutions start at $1 million, while high-end systems comprising dozens to hundreds of processors can cost up to $50 million, analysts said.

Unisys faces several marketing challenges. While demand for parallel systems in federal agencies with enormous databases — such as the Internal Revenue Service — bodes well for Unisys, other smaller, cash-strapped agencies might not have the funding to purchase such systems. On the commercial side, Unisys must convince its customers that there is a business requirement for high-volume, decision-support systems.

"I don't care if it has four Pentium chips or nine squirrels in it. The question is, what does it do, and what does it cost?" said Jeffrey L. Ehrlich, senior vice president of technology at National Data Corp., an Atlanta-based developer of specialized financial and health care applications and a Unisys 2200/500 mainframe shop.

Dennis Thompson, MIS director at the Massachusetts Department of Employment and Training in Boston, added, "We're not looking to expand on our existing system [a Unisys 2200/9222]. If anything, we're taking things off of it."

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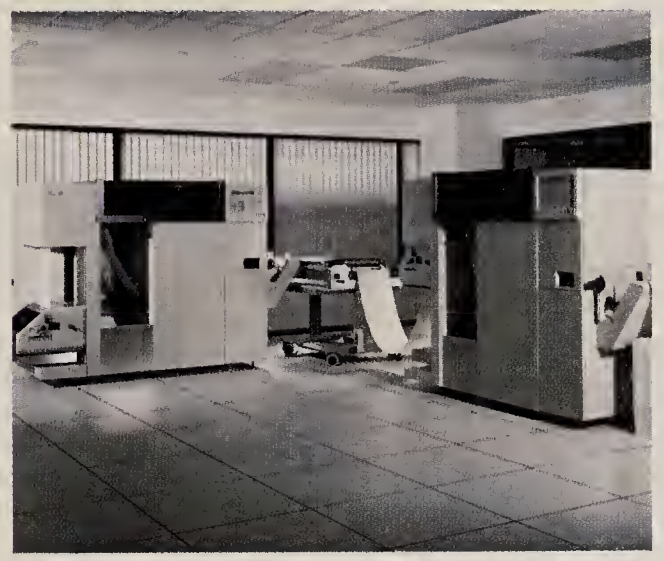

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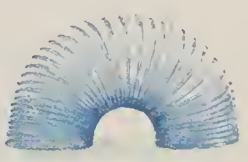

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News Shorts

Utility, ISSC sign outsourcing pact

PECO Energy Co. said it is handing over most of its information teehnology operations to IBM's Integrated Systems Solutions Corp. in an outsourcing deal valued at $450 million over 10 years. PECO hopes to save $150 million in that time. The Philadelphia-area eleetric utility will retain new applieation development, while ISSC will pick up data eenter operations, the help desk and LAN and desktop administration and maintenanee.

Pentium notebook due from Tadpole

Tadpole Technology, Inc. today will announce the industry's first 100-MHz Pentium proeessor-based notebook that ineorporates a Peripheral Component Interconneet bus. The Tadpole P100 features 128M bytes of memory and high-eapaeity 810M-byte removable disk storage. The high-end features eome with a high-end price tag, too — $7,495 for a starting system. The first units will ship early next year.

A Penney for your ATM

JC Penney Co. in Plano, Texas, has launehed a trial Asynchronous Transfer Mode network using equipment from AT&T Corp., Cisco Systems, Inc. and Southwestern Bell Corp. The network will be among the first to use 155M bit/sec. Synchronous Optical Network ATM applieations in both local and wide areas, Cisco said. The network will be used for a multimedia merehandising applieation and mainframe file backups.

Prodigy unveils Web server

Prodigy Services Co. last week launehed AstraNet, a World-Wide Web server on the Internet. AstraNet is an independent service that will eontain information from Prodigy's core service and outside providers, aceording to the company. Next month, AstraNet will unveil its first premium services.

HP switches to CD-ROM distribution

Hewlett-Packard Co. said it will start distributing software to HP 9000 eustomers on CD-ROM as part of an effort to improve produet delivery. The eompany will all but phase out digital audiotape-based software distribution in the next three years.

Virtual organizations step toward reality

IBM, Hewlett-Packard Co., Digital Equipment Corp. and a dozen other large U.S. companies have formed a coalition aimed at developing virtual enterprises. The National Industrial Information Infrastructure Protocols (NIIP), formed in September, will use existing Internet, objeet-oriented, open systems and software agents instead of developing new technology, according to NIIP director Riehard Bolton. The first products are due late next year.

SHORT TAKES Ryder System, Inc. last week named Bruee D. Parker, a former senior systems manager at Ameriean Airlines, to the post of senior vice president of MIS and ehief information officer.... NCube plans to unveil a new massively parallel computer, NCube 3, next week.... Apple Computer, Inc. cut prices on its PowerPC-based Workgroup Servers by up to 11%.... Microsoft Corp. said it will develop television set-top boxes with a bevy of partners.... Although employees of the *San Francisco Chronicle* and *San Francisco Examiner* are on strike, both papers eame out on the Internet. Striking workers responded by putting their new publication, *The Free Press*, on the 'net as well.... Stac Electronics, Inc. bought Ocean Isle, Inc., maker of the ReachOut remote access tool, for $20 million. Stac will soon release a family of enterprise storage and communications management products.

Lotus piles up alliances to bolster Notes ability

By Lynda Radosevich

Lotus Development Corp. appears to be penning new partnerships faster than the ink can dry on earlier ones. The goal, aeeording to analysts, is to cement Notes' groupware market lead by integrating it with industrial-strength databases, management software and server hardware.

The outcome for users should be the ability to better create and manage large-scale applieations that combine Notes' document database, electronie-mail and replication technologies with, say, the transactional integrity of a high-end database.

But some Notes eustomers were incredulous that Lotus ean provide meaningful benefits through so many technology alliances.

"The problem I have with Lotus is that they have an 'announcement of the week,'" said Arthur Trantolo, manager of advanced teehnologies at ABB Information Management Serviees in Windsor, Conn.

Lotus is likely to complete a partnership with HP next, according to sources close to Lotus. Highlights are expected to include:

ITEM NotesView, a Notes management application for HP OpenView

BENEFIT The ability to graphically manage Notes replication schedules and monitor Notes performance via graphical reports

ITEM Bundling deals with OpenView and HP servers

BENEFIT Lower prices on Notes/OpenView combinations and Notes/OpenView/HP 9000 server combinations

ITEM HP service and support for Notes

BENEFIT One-stop shopping for Notes hardware and software

Keep 'em coming

With the dust barely settled on an Oetober pact with Oracle Corp. to integrate Notes and Oracle's multimedia database software, sources elose to Lotus said more deals are in the works, including the following:

- Sybase, Inc. has plans to develop customized links between Notes and the SQL Server 10 database.
- Hewlett-Packard Co. plans to offer the NotesView management applieation for HP OpenView and bundle Notes on HP servers.
- IBM plans to develop a Notes management application for NetView/6000.

Lotus also confirmed it recently completed an unannounced deal to license technology from software distributor Corporate Software, Inc. to use in InterNotes, a product that will offer two-way links between Notes and the World-Wide Web.

Other reeent alliances include a September agreement with Intel Corp. to link Notes with Intel's ProShare videoconferencing software and a March agreement with AT&T Corp. to ereate a publie Notes network due early next year.

A Lotus official confirmed that the HP deal is imminent but would not comment on IBM and Sybase arrangements. However, Lotus President and Chief Executive Offieer Jim Manzi recently confirmed talks were under way with IBM.

The foremost question for some users is when or whether Lotus can deliver on its promises to create specialized links between Notes and so many other products. In most cases, building the links requires a big chunk of development effort, observers said.

"The problem is, can they get it all to work? Notes is a great product, but as a developer's tool it leaves a lot to be desired," said George Hoffmann, an information specialist at Sandoz Agro, Inc., an argiehemical eompany in Des Plaines, Ill.

He said customized Notes/database integration is not necessary beeause developers already can create links using Microsoft Corp.'s Visual Basie and tools such as Brainstorm Technologies, Inc.'s VB/Link for Notes (see story page 4).

Strategic alliances

Jeff Papows, vice president of Lotus' communications business group, said the alliances are a key part of Lotus' strategy to build up Notes as a development platform. Furthermore, most of the technology agreements require that the partnering company bear the weight of funding and engineering the integration efforts, he said.

"It's got nothing to do with diverting resources from work on [Notes] Version 4.0" and several simultaneous changes under way, Papows said. He referred to scalability, improved user interfaees, usability issues, wide-area management and eost of ownership.

Some users agree that the deal-making is a positive sign that Notes, which is known for being proprietary, is becoming more open. "We've been pushing Lotus to connect Notes to legacy and large-scale database systems so we can use the best features of both," said Sheldon Laube, national director of information technology at Priee Waterhouse, a Big Six consulting firm and Notes site. "Lotus has responded quite well."

Notes 4.0 surprises

Third-party developers who received alpha code and developer's kits for Notes Release 4.0 in the past two weeks said the forthcoming product looks more stable than expeeted and is slated to go into beta testing in April.

Lotus would eommit only to a winter beta release. One eompany official said that although Lotus hopes to ship Notes 4.0 in mid-1995, it will likely ship versions for different operating systems in two phases, with the second phase falling roughly 100 days after the mid-1995 ship.

The developers, who asked not to be identified, said the user interface seems to have received the greatest overhaul. Some said questions remain about promised server enhancements, such as improved performanee. Among the improvements eited by the developers were the following:

- A forms design feature that lets users launch document links by clicking on images, buttons or text.
- An object-based forms design that lets developers store often-used items, such as name and address fields, in an object format for reuse.
- A new user interface that allows users to split Notes screens into several panes similar to CC:Mail and allows users to simultaneously view folders and documents.
- Desktop software agents that let users plaee conditions on E-mail, file or database changes that trigger a variety of actions. —*Lynda Radosevich*

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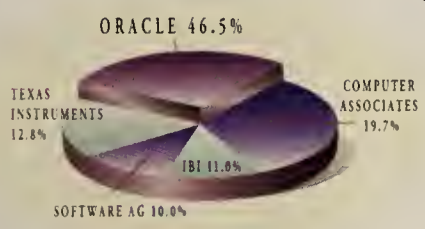

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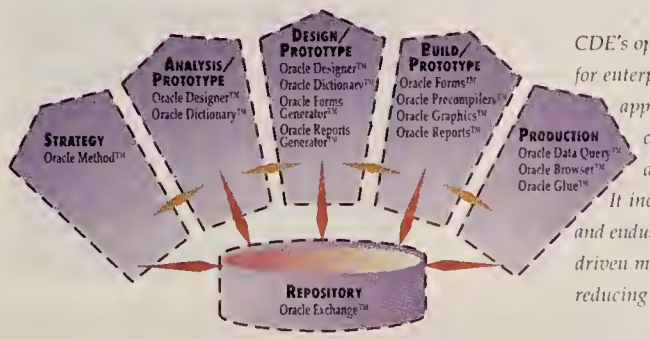

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ORACLE

Justice Department stays on top of Microsoft

By Mitch Betts
WASHINGTON

The U.S. Department of Justice last week urged speedy court approval of its antitrust settlement with Microsoft Corp. in order to ensure that Windows 95 faces healthy competition in the PC operating system market.

Microsoft agreed to abide by the proposed settlement while the court reviews public comments, but the Justice Department said the industry needs prompt reassurance that the proposed accord's ban on monopolistic licensing practices will be approved and enforced.

Microsoft's latest ship date for the next version of Windows is the first quarter of 1995.

"OEMs considering alternatives to Microsoft's forthcoming Windows 95 product need to know that they may shop the competition without paying a royalty to Microsoft for each computer they sell," the department explained in an otherwise routine filing to the U.S. District Court in Washington.

"Other operating system suppliers also need to make development and marketing decisions with the assurance that Microsoft's per-processor and per-system licenses will no longer artificially limit the market for their wares," the department continued.

The general thrust of the government's antitrust case was that Microsoft's onerous licensing policies denied competitors a fair chance to get their operating systems loaded onto PCs for sale.

Approval awaited

The proposed settlement was signed July 15 but was subject to a public comment period, which ended Oct. 18. It now awaits final approval by the court.

However, the high-profile antitrust case elicited only five written comments — none from such Microsoft rivals as IBM, Novell, Inc., Borland International, Inc. or Lotus Development Corp.

In fact, the only public comment the Justice Department deemed worthy of significant discussion was from IDE Corp., also known as IDEA. The Billerica, Mass.-based OEM said the government should order Microsoft to refund more than $2 million in up-front royalties that IDEA paid under minimum-commitment software licenses, which the settlement prohibits.

The Justice Department, however, did not go along. The agency said the goal is to ensure competition in the future and not to refund unused royalty payments.

Here we go again?

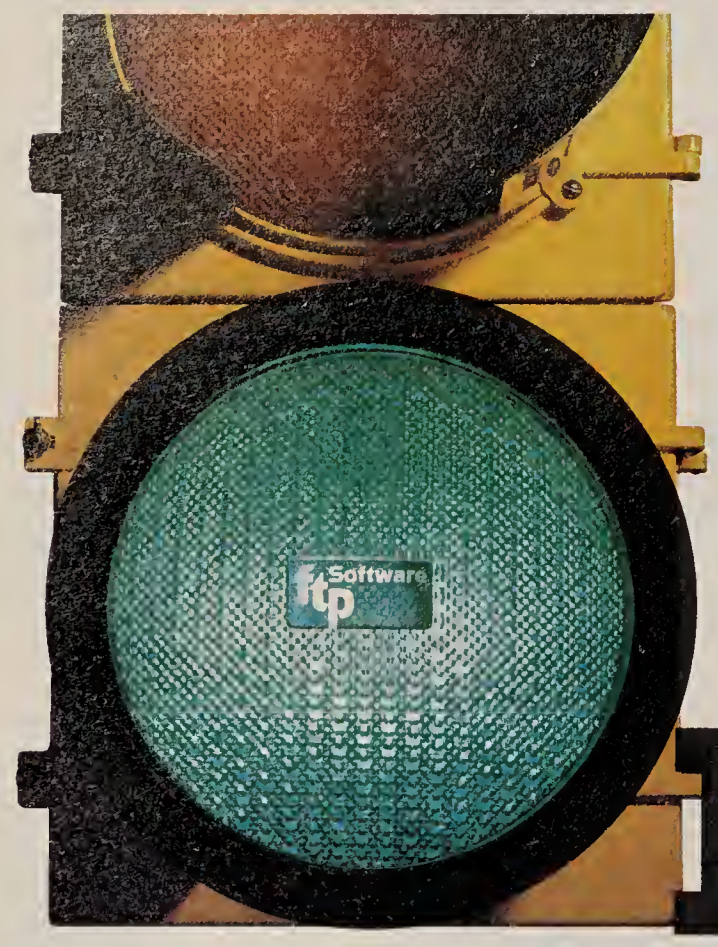
Reports surfaced late last week that the Department of Justice is considering extending its investigation into Microsoft's $1.5 billion acquisition of Intuit, Inc. Such an investigation could cause a delay in completion of that deal.

Officials from the Justice Department and Microsoft were not available for comment.

Justice had completed a first review of the deal, but now government lawyers reportedly are prepared to begin a second "request for information."

With few details available, three industry analysts last week said they did not understand why a second look at the deal is necessary. Some noted that Microsoft appeared to go out of its way to avoid such an investigation by selling its Money personal finance program to Novell once it acquired Intuit's competing Quicken program.

"Are they going to penalize Microsoft for imputed intent? Maybe they are now making megalomania a federal crime," said Jeff Tarter, editor of "The Soft Letter" in Watertown, Mass. — *Ed Scannell*



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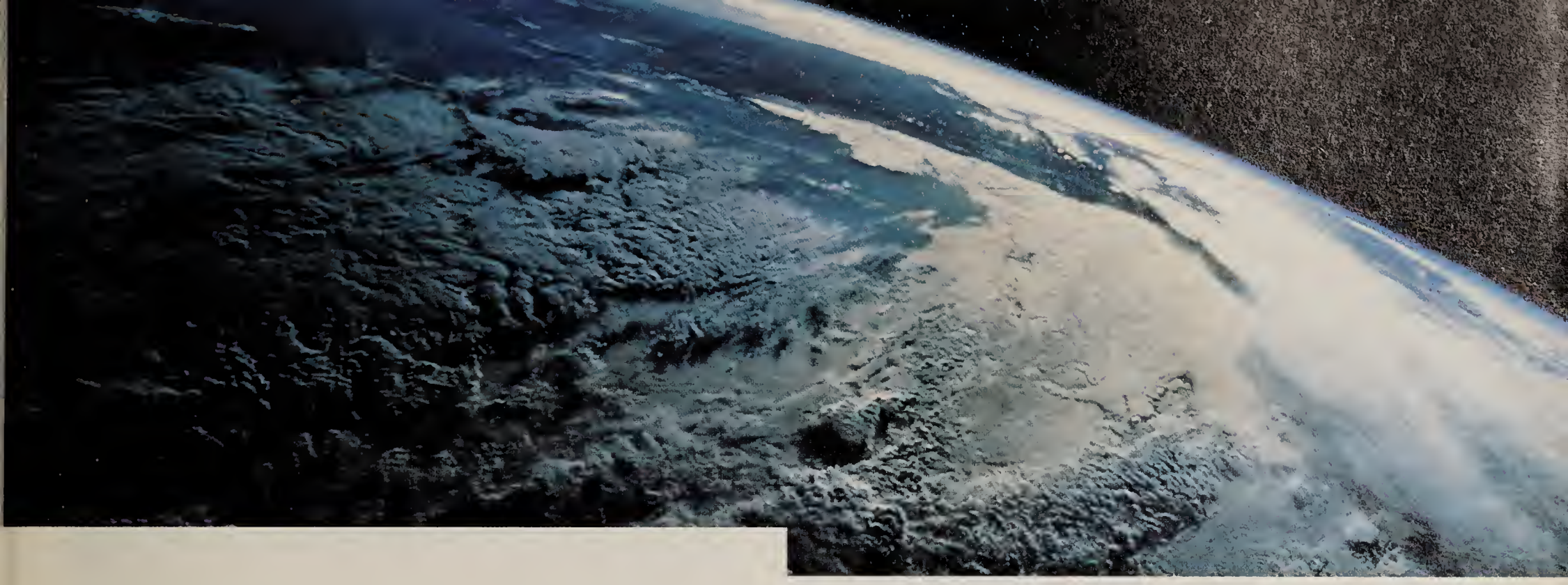

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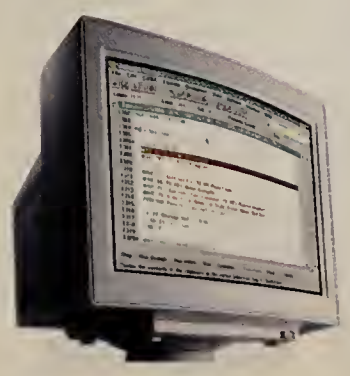

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Network compatibility in works

Wireless competitors team up on standard API to spur app development

By Michael Fitzgerald

The major wireless network players are working on a uniform application programming interface (API) that will let incompatible networks receive data from one another, according to Martin Levetin, a senior vice president at RAM Mobile Data USA L.P.

Network and modem protocols dictate that users must have different modems to run applications written for RAM Mobile Data or the Advanced Radio Data Information Services (ARDIS) network and standard connectivity applications such as Lotus Development Corp.'s CC:Mail. The ARDIS and RAM Mobile Data networks also require separate modems.

Even worse, the Cellular Digital Packet Data (CDPD) network, when it exists, will require yet another type of modem.

The result has been very little application development of any sort for wireless devices. "There's no point in RAM, CDPD and ARDIS arguing about who's the biggest network when everybody's afraid to develop applications for [any of them]," Levetin said last week. "We need to get applications and then worry about market share."

Toward that end, RAM Mobile Data is working with its competitors, including McCaw Cellular Communications, Inc., Ardis Co. and other wireless suppliers, to create a set of standard APIs in the Open Systems Interconnect (OSI) protocol stacks. Such a set of APIs would allow packet modems and AT modems to exchange data, Levetin said. He added that announcements about the API effort are likely to appear early next year from the Portable Computer Communications Association.

The core notion behind the standardizing effort is to leverage TCP/IP through the OSI protocol stack. TCP would act as the transport layer between the currently incompatible networks by linking two OSI levels — the AT-modem-compatible Winsocket API and the packet-modem-compatible Network Device Interface Specification interface.

First Type III card
Ericsson last week announced the M2190 OEM Wireless Modem, the first wireless modem card that fits in a Type III PCMCIA slot.

Analysts agreed that a uniform front was better than today's splintered approach, but they wondered if it would improve things much.

"If they could create a uniform API that allows you to develop a single application that runs across all three of those [networks], that's going to be a tremendous boon," said Mike McGuire, an analyst at Dataquest, Inc. in San Jose, Calif. Wireless networks, however, will still face the issue of getting software developers to write for networks with few users, he noted.

Comdex news

On other mobile fronts, Levetin confirmed a number of announcements involving RAM Mobile Data that are set for Comdex/Fall '94 next week. These include the following:

- Motorola, Inc.'s Research in Motion development group will release two software development tools, RAD/AT and RAD/IO. RAD/AT gives Motorola InfoTac and Ericsson Mobidem modems the ability to read files from AT-based applications. RAD/IO is a transfer code that spares developers the difficult task of writing that code for the RAM Mobile Data environment.
- Rockwell, Inc. will introduce a chip set that supports RAM Mobile Data, resulting in a dramatic reduction in the price of modems that support data and fax over both wired and RAM Mobile Data networks. Apex Data, Inc. and four other vendors will announce products that will ship in the first half of next year and cost $400 to $500, said Alan Reiter, editor of the "Mobile Data Report" in Alexandria, Va.
- Ericsson will introduce much cheaper base stations, which will lower network costs as RAM Mobile Data builds out its network from 900 stations today to 1,400 stations in 1997.

Windows 95

Third parties to bolster support

As it prepares the second major beta release of Windows 95, Microsoft Corp. last week announced the winners in its lottery to outsource technical support for the upcoming 32-bit desktop operating system.

The program will use a centralized Microsoft-owned switch to route callers looking for Windows 95 support to either its own internal technical support personnel or to the next available support professional at any of five firms.

Microsoft tech support currently averages 23,000 calls a day for all products.

Companies chosen for the Windows 95 Launch Support Team are Digital Equipment Corp., Keane, Inc., MicroAge Computer Center, Inc., Softmart, Inc. and Unisys Corp., said Deborah Willingham, vice president of Microsoft's Product Support Services organization.

Microsoft's plan includes installing a new central phone switch to help handle the expected flood of calls when Windows 95, the next version of Windows, ships next year [CW, Aug. 29]. The support contractor companies will stay online and provide Windows 95 support "for as long as we need them for the peak — typically six to nine months," Willingham said.

Callers to Microsoft's number for Windows 95 technical support will be routed to the next available support professional, and outside personnel will be trained to provide support specifically for Windows 95, Willingham said.

This month, Microsoft will send copies of Windows 95 to more than 100,000 users. Classes to train staff at each company will also begin this month. — *Stuart J. Johnston*

Tool eases Mac port of Windows applications

By Stuart J. Johnston

Life is becoming easier for developers who want to write versions of their programs for both Windows and the Macintosh.

This week, Microsoft Corp. plans to begin shipping its Visual C++ Cross Development Edition for the Macintosh. The package enables developers to write Windows applications and then, with very little recoding, recompile the same program to run on the Macintosh.

"I'd say it cuts my overall development time down by at least 40%" because it provides one source-code base for two platforms, said Jim Bohannon, senior software engineer at Perkin-Elmer Corp.'s Applied Biosystems Division in Foster City, Calif.

Presto ports

Bohannon's group, which beta-tested the product, writes analysis programs that run on both Windows and the Macintosh. In one recently developed program, there were only "about seven lines" of Macintosh-specific code, so cross-platform porting of the product went extremely fast. "It basically took no extra time," Bohannon said.

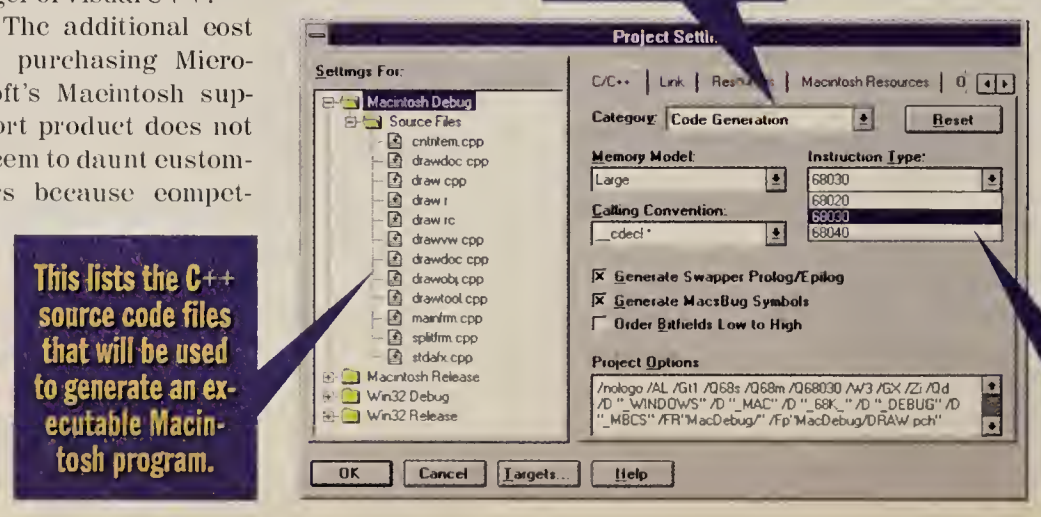
Additionally, two beta testers raved about the product's integration and simplicity vis-a-vis competing products such as XVT Software, Inc.'s XVT, which costs $2,000 per platform, Bohannon said.

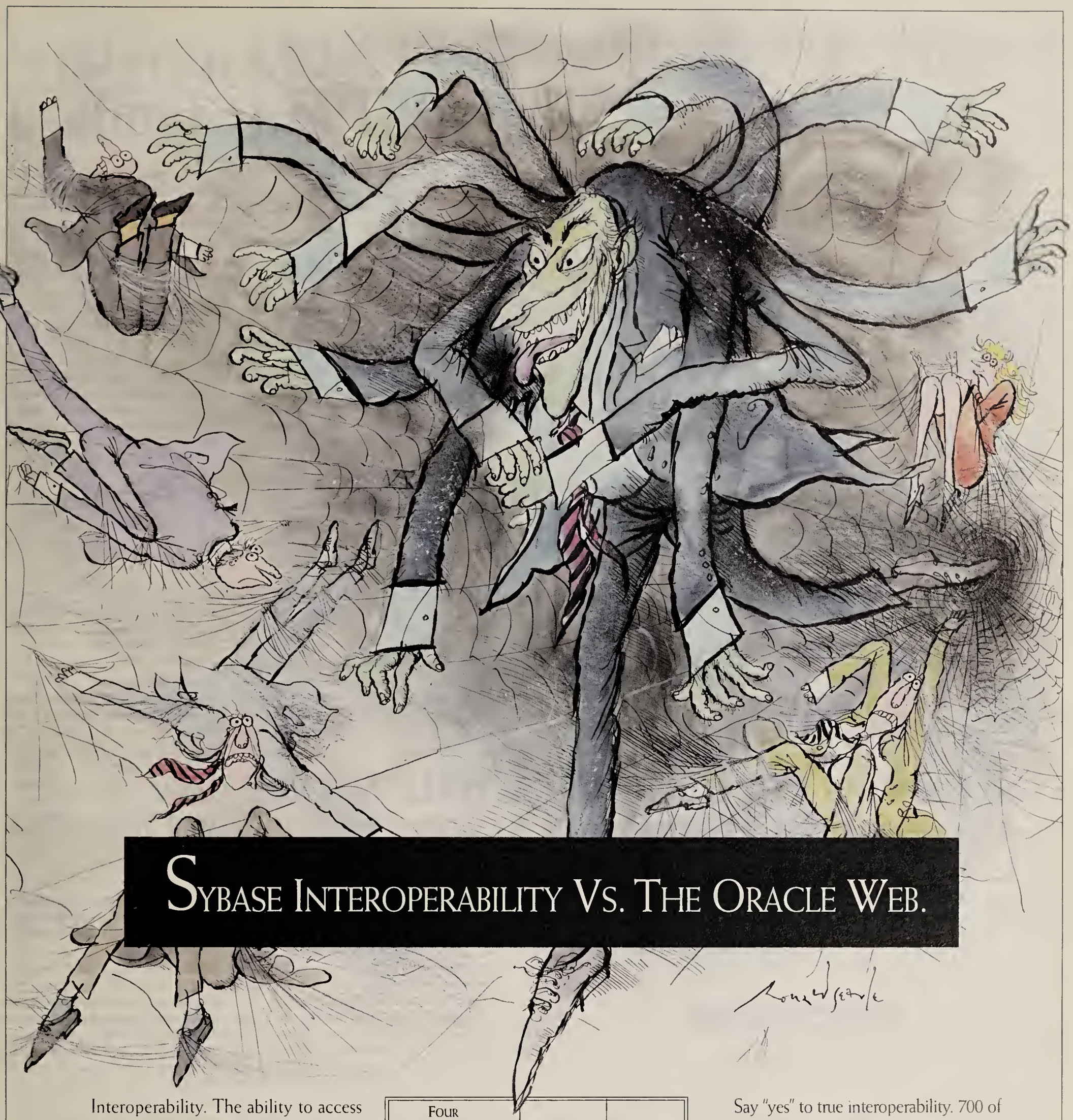
"It's easier to program [than competing products], and it takes less people to do the job, so you can get more out of your staff in addition to doing more," said Stephen Hamilton, workstation products manager at Online Computer Library Center, Inc. in Columbus, Ohio, which provides centralized databases and services to libraries. Additionally, Hamilton said he is looking forward to cross-development support for other platforms such as Unix, which Microsoft said it will provide.

Developers, on average, should be able to expect "90% portability for [applications written using] Microsoft's Foundation Classes," said Denis Gilbert, general manager of Visual C++.

The additional cost of purchasing Microsoft's Macintosh support product does not seem to daunt customers because competing products cost as much or more and do not provide the integration that Visual C++ does, the beta testers said. For example, Neuron Data, Inc.'s Open Interface product costs $4,800 for the Windows version and an additional $7,500 for the Macintosh version.

There are some license limitations, however. While most applications can be distributed with no additional royalty payments, separate redistribution licenses are required for development tools from competitors to Microsoft's class libraries and for mainstream competitors to Microsoft's productivity applications. Users need Visual C++ 2.0 for the Intel platform, which costs $399 and is hosted on Windows NT 3.5. The Macintosh cross-development add-on costs an additional $1,999.





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PowerPC clones in the works

By Jaikumar Vijayan

As IBM continues to delay announeement of a PowerPC-based desktop system, other vendors have begun to piek up the slaek.

FirePower Systems, Inc., a Menlo Park, Calif., start-up, last week announeed high-end uniprocessor and dual-processor PowerPC 604-based desktops and servers that OEMs and systems integrators will sell.

Two box makers, Canon Computer Systems, Inc. and IPC Teehnologies, Inc. in Austin, Texas, already have announced plans to sell systems based on the FirePower design, according to FirePower. Other PC vendors are expeeted to announce similar clone products by year's end, FirePower said.

Canon will license the design from FirePower, while IPC will relabel and resell FirePower's systems.

All in the family

The new Powerized family from FirePower, financed by Canon, features a single-processor server, a symmetrical multiprocessing (SMP)-enabled server and a dedieated SMP server based on the PowerPC 603 and 604 processors. The machines, which are eompliant with the original PowerPC Referenee Platform (Prep) standard, will run IBM's AIX operating system as well as Windows NT and OS/2 for SMP when it becomes available.

FirePower will incorporate the new unified Prep standard from Apple Computer, Ine. and IBM when it becomes available.

The starting priee for a uniproeessor 100-MHz, 604-based system with 16M bytes of RAM, a 340M-byte hard drive and 64-bit graphics is expected to be about $3,250. It will be available from Canon and IPC in the first quarter.

The imminent availability of these high-performance PowerPC clones in 1995, however, has received only a lukewarm reeeption from end users.

"PowerPC certainly holds promise, but it really is too early to see what it is going to be able to do for me," said Marshall Fernholz, a network eontrol manager at the Ameriean Medieal Association in Chicago.

Do you plan to evaluate Motorola PowerPC-based PCs in the next year?
(Number of respondents listed)

	YES	NO	DON'T KNOW
COMPAQ Base: 51 users	22	24	5
DELL Base: 53 users	23	21	9
GATEWAY Base: 57 users	16	34	7
IBM Base: 42 users	20	17	5

Source: *Computerworld*'s Buyers' Satisfaction Scorecard

Also, as speeulation continues to escalate over the emergenee of the IBM/Apple standard, some users said they would wait for a common standard to appear before looking at the elone market.

"From our perspeetive, elones without the Mae [operating system] hold little interest," said Robert Anderson, a senior analyst at automotive produet manufaeturer A. O. Smith Corp. in Milwaukee, whieh uses Maeintoshes almost exelusively. "In general, people seem to be waiting for a unified Prep standard. If that doesn't happen, there is little question PowerPC is going to fail."

PCMCIA unveils PC Card Standard

By Miehael Fitzgerald

The PCMCIA's new PC Card Standard, announeed today, should lay to rest most user eoneerns about the credit-eard-size deviees.

"They're fixing the worst of the holes in the standard," said Jenni Ceurvels, an analyst at BIS Strategic Decisions in Norwell, Mass. However, she said this would not guarantee complete card interoperability. Murphy's Law "is still alive and well and working in this industry," she said. But most user eomplaints will be laid solidly to rest, she added.

From a user perspeetive, the key features in the new standard inelude the following:

- Power Management Serviees, which will allow the system to turn the eards on and off in the same fashion as other components of notebook computers.
- 3.3V and dual 3.3V/5V capabilities, whieh will reduee the power draw of the eards.
- Support for multifunetion eards, whieh will reduee eonfiguration and integration issues.
- An expanded Card Information Strueture, whieh is key to improving PC Card compatibility with notebook eomputers.

In addition, the revised PC Card Standard specifies direet-memory aeeess, which enhanees eompatibility by relieving hardware designers of the need to write memory-aecess drivers, and a 32-bit CardBus interfaee.

The faster CardBus interfaee may spark interest among desktop vendors for putting PC Card PCMCIA slots in their systems.

PCMCIA offieials said the standard would stabilize the mobile computing market enough to let the association try to expand the standard to desktops, printers, eellular phones and television set-top boxes.

However, analysts said they do not expeet PC Cards to appear in any volume outside the mobile eomputer market until 1997 at the earliest. The standard may end the tongue-stumbling PCMCIA abbreviation for Personal Computer Memory Card International Assoeiation. PCMCIA will now refer to the assoeiation, and produet-related terms will eome under the PC Card name.

A closer look at notebooks. See page 41.

Dell pushes Pentium-based SMP server

Company begins initial foray beyond the desktop

By Jaikumar Vijayan

Dell Computer Corp. last week outlined a plan to launch itself into the enterprise in the next 18 months.

In what it described as the first step toward that goal, the company today will announce its first scalable symmetrieal multiprocessing (SMP) servers with dual 90- and 100-MHz Pentium processors.

Dell PowerEdge XE 590-2

PROCESSOR	90-MHz Pentium
RAM	32M bytes
HARD DRIVE	2G-byte SCSI
CACHE	512K bytes
SLOTS	Integrated PCI/SCSI and PCI
PRICE	$9,690

The servers will top Dell's PowerEdge family of high-end systems, with Peripheral Component Intereonnect (PCI) support, 256M bytes of error checking and eorrecting memory, Fast SCSI-2 on the PCI local bus, hot-pluggable drives, subsystems and redundant arrays of inexpensive disks support.

Integrated with the hardware will be Dell's SafeSite server management software, which gives users the ability to monitor, log and respond to systems alerts from remote nodes on the network.

The SMP announeement marks the first phase of Dell's attempt to break into the eorporate data eenter, said Mark Garver, formerly viee president at superserver vendor Trieord Systems, Ine. and now Dell's viee president of advaneed systems.

"We are really foeused on getting into the groupware and entry-level database services market," Garver said. The firm expects to add quadprocessor support by mid-1995 and hopes to ride Intel Corp.'s next generation P-6 teehnology into the enterprise when that becomes available in 1996, he added.

For the moment, however, a major part of Dell's server plans focus on building credibility in the high-stakes groupware and database serviees markets, analysts said.

"There is plenty of money to be made in the departmental server market," but the rules could be vastly different from what Dell is accustomed to, said James Greene, an analyst at BIS Strategie Deeisions in Norwell, Mass.

"Dell has got a good solid product at a good priee point," Greene noted. But with its direet-sales PC baekground, the vendor has its work eut out to break into the enterprise level, he added.

Receptive to idea

Users were eautiously optimistie about the eompany's long-term server strategy.

"Dell has done a lot of things right in the past, so they do seem to have a shot at the enterprise," said Marshall Fernholz, network eontrol manager at the American Medieal Assoeiation in Chicago. "But their foeus needs to be on absolute commitment to reliability and support. The customer has too much at stake to expect anything less than total eommitment."

"I've got an open mind as far as using Dell is concerned," said Randal Shaw, a senior end-user serviees analyst at the Federal Reserve Bank of Baltimore. However, he added, the enterprise market is one in whieh people are generally eonservative about choosing vendors, and Dell would have to demonstrate its reliability and support to suceeed there.

Vendors release slew of Pentium-based systems. See page 46.

Satellite eases into delivery

At Comdex/Fall '94, Hughes Network Systems will unveil a subseriber serviee that will offer a new medium for delivery of information to the desktop via satellite teehnology.

Called DireePC, the high-speed information delivery service will use small satellite reeeiver technology and digital satellite transmission to pump doeuments, video and software from distant loeations direetly into the PC. For instanee, the service can enable a software company to mass-distribute produet software and upgrades to thousands of PCs in minutes, aeeording to Hughes.

Using a 24-in. dish antenna and a 16-bit Industry Standard Architeeture adapter card that plugs into standard Intel Corp. I486-based and higher PCs, DireePC will initially offer subscribers aeeess to three services for a monthly subscription rate of approximately $15.95. The offer beeomes effeetive in January.

— Jaikumar Vijayan

Apple

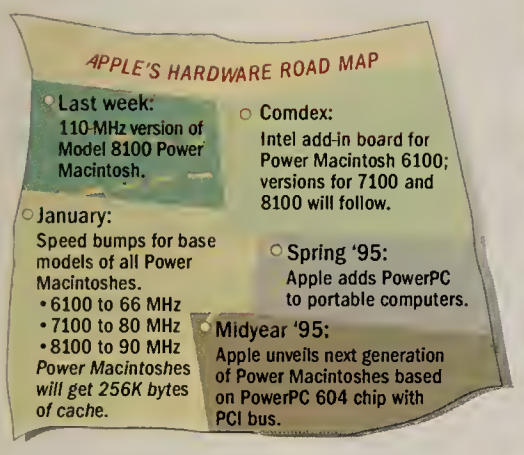
CONTINUED FROM COVER 1

Windows software performance on Power Macintoshes than the current software emulation can provide. Apple is expected to offer a 33-MHz DX board by early next year and plans other boosts to the Power Macintosh line in the near future.

Polishing the Apple

Apple users were upbeat about the new product flurry.

Bob Duffy, information systems manager at Cornish & Carey Residential Real Estate in Palo Alto, Calif., said he plans to standardize on the Power Macintosh as he ties together about 20 Northern California offices in a system capable of sharing up-to-the-minute video and text accounts of property. Duffy now uses Microsoft Corp. Windows NT servers and Macintosh desktops but foresees a move to Power Macintosh servers once they can work with Novell, Inc.'s NetWare. Apple expects to make that happen by year's end.



"We like what the Apple processor can do, and we imagine that with the next evolution there might be a lot of things like videoconferencing that it will support," Duffy said.

Plans for the future

Users briefed by Apple in the past month said future moves will include January improvements in speed and memory caching for the Power Macintoshes 6100, 7100 and 8100/80, the spring addition of PowerPC-based notebooks and the mid-1995 announcement of next-generation Power Macintoshes based on the PowerPC 604. Apple will then incorporate a Peripheral Component Interconnect (PCI) bus system to replace its Nubus.

Apple was the leading shipper of PCs in the U.S. in the third quarter, with 640,000 units compared with Compaq Computer Corp.'s 600,000 and IBM's 500,000, according to International Data Corp. in Framingham, Mass.

Apple last week declined to comment on any future products. The company said it has shipped more than 600,000 Power Macintoshes since it began offering the PowerPC 601-based line in March. It is on target to meet its goal of shipping 1 million units in the product's first 12 months, a spokesman said.

Meanwhile, PowerPC co-developer IBM has yet to offer a PowerPC-based desktop system as it wrestles with the decision of which operating systems to offer and hashes out a common platform agreement with Apple.

Some users, such as Lockheed Corp. systems analyst Greg Chirichigno, said they are waiting for the next-generation Power Macintoshes expected around June.

Chirichigno said the combination of the PowerPC 604 chip and the faster PCI bus systems augurs performance increases that are worth the wait. IS organizations with tight budgets might want to wait for those releases lest they "make an investment in something that's going to soon be outperformed by two to three times," he added.

Martin Zumbrunnen, systems administrator at Covey Leadership Center, Inc. in Provo, Utah, said he plans to purchase the 8100/110 "as soon as they are readily available." Zumbrunnen said he plans to deploy the machines as file servers and desktop publishing workstations.

Apple priced the new box at $6,379 and included a 2G-byte hard drive — twice the storage of the 8100/80. The box also includes 16M bytes of RAM, a double-speed CD-ROM drive and a 1.4M-byte floppy drive. As with all Apple prices, $6,379 does not include a keyboard or a monitor.

Apple pushes high-speed interface that will better support telephony. See page 44.

Tapping TCP/IP for free

Internet shareware has downside in support, security issues

By Steve Moore

The high cost of TCP/IP software has prevented many network managers from providing end users with the network connectivity they clamor for in the face of growing Internet use and the emerging information superhighway.

"Getting TCP/IP on people's machines is an expensive proposition," said Sheldon Laube, director of information and technology at Price Waterhouse in Menlo Park, Calif. Although future operating systems such as IBM's OS/2 Warp; Microsoft Corp.'s Windows 95, the next version of Windows; and Novell, Inc.'s NetWare 4.0 (see related story cover 1) will have built-in TCP/IP, the protocol stack "costs a couple of hundred bucks per machine today," he said.

But in the window of opportunity before these TCP/IP-laden operating systems are widely deployed, another form of relief is available now — and it is free. There are industrial-strength software gems to be found on Internet servers. Corporate information systems and telecommunications managers stand to save money by using free software in place of commercial packages.

"We have modified public domain TCP/IP software so it can talk to Novell and Banyan servers," said Joe Askins, director of data communications at Arizona State University in Tempe.

The modified software is freely available on the university's Internet server, and Askins said some Internet gopher service providers have already downloaded it to give to their customers.

Industrial-strength software gems can be found in the public domain.

Yet while free TCP/IP software might help users such as Laube and Arizona State cut costs, it does have a downside.

"It makes sense [to go this route] if you have critical mass in terms of in-house staff expertise so you can maintain the software with little assistance from the providers," said John Morency, a principal consultant at Strategic Networks Consulting, Inc. in Rockland, Mass.

Getting the best deal

He warned that the Internet is not the best source for protocol software or other crucial software because failures or lack of support can have significant effects on the quality of service.

To get the best of both worlds, users should first purchase licensed software to get a vendor's support and service guarantees and then tap into the Internet for further functionality and informal expertise, Morency said.

"The value the Internet brings is access to a large pool of vendor and nonvendor support expertise that goes beyond what is available from the software provider itself," Moreney said. Through forums on the Internet, CompuServe and other Internet-linked information services, "users can have access to a wide universe of support at low cost," he said.

Lack of formalities

Software dissemination via the Internet raises other important concerns, as well. "There are lots of highly creative and innovative people out there who are being brought into a collaborative groupware process, and the issues relating to intellectual property, security and support are being invoked and explored," said Tony Rutkowski, executive director of the Internet Society in Reston, Va.

"This is all occurring in such a short time period that we probably need more collective experience before any formalities or frameworks are even discussed," Rutkowski said.

HP caters to Unix shops, adds products

By Steve Moore

As users accustomed to the finer things in mainframe systems management migrate toward client/server computing, they hunger for equivalent systems management capabilities across multiple Unix environments.

In an effort to satisfy that hunger, Hewlett-Packard Co. last week added nine more systems management products to the four that already use HP's Performance Collection Software (PCS) as a data collection tool.

Systems management

PCS provides consistent performance data collection across HP, SunSoft, Inc. and IBM Unix platforms and supports systems management functions such as capacity planning, statistical analysis, performance analysis and workload scheduling. Next year, HP plans to add PCS support for Microsoft Corp.'s Windows NT and AT&T Global Information Solutions' platforms.

"HP's real thrust is to sell PCS as a component of their partners' products," said Paul Mason, a research manager for enterprise systems management at International Data Corp. in Framingham, Mass. "High-end users would care about it because they will now be able to concentrate on developing applications rather than dealing with differences in Unix variants."

Another significant boon for users, Mason added, is that PCS may enable systems management software vendors to standardize their data collection methods and compete solely on product features and functionality. PCS has a data source integration feature for ironing out troublesome inconsistencies that historically have prevented users from easily integrating performance data from various flavors of Unix.

Users in both single-vendor and multivendor Unix shops applauded HP's move. "I'm trying to find a way of bringing the skill set we have in our mainframe environment to bear in our distributed Unix environment," said Ron Welf, manager of performance and capacity planning at Charles Schwab & Co. in San Francisco and a beta user of PCS.

PCS will enable Welf to solve the basic problem of collecting performance measurement data from his installed base of Sun, IBM and HP Unix systems, he said. However, Welf added, "We're still going to have to deal with synthesizing and correlating it."

"We do market PCS to end users as an agent technology," said Jim Grant, HP's product marketing manager for performance and resource management products. Grant said HP and its partners view PCS as a potential de facto standard in the systems management arena.

TCP/IP gains equal footing

CONTINUED FROM COVER 1

and-stay resident TCP/IP stacks because the 32-bit VXDs run in protected mode under Windows. As a result, they are faster and require virtually no extended memory on the client.

VXDs and DHCP have gained the backing of most TCP/IP vendors, as well as some major systems vendors such as Hewlett-Packard Co. If Novell had not jumped on the VXD bandwagon with its NetWare 4.1 delivery, it would have found the bulk of new Internet and TCP/IP applications running with TCP/IP newcomers Windows 95, the next version of Windows, and NT Server 3.5 from Microsoft. Currently, almost all TCP/IP vendors have a VXD TCP/IP stack and applications available or under development.

Instead, Novell officials last week said the company would deliver a VXD version of its NetWare/IP, a version of IP that runs on NetWare clients. The Novell officials said they did not know if the VXD version of NetWare/IP would ship when NetWare 4.1 is announced next month but said they would at least make it available soon after.

Perhaps more significant is Novell's support of DHCP, which enables a network administrator to manage and install TCP/IP stacks in remote PCs from one location. Until now, each desktop running TCP/IP has required a network administrator to track these addresses by hand, a bane to most network managers.

Microsoft offers DHCP support in NT Server 3.5 and will deliver it in its Windows 95 client.

"DHCP essentially cuts the time and headaches out of managing TCP/IP desktops," said Ray Hiltbrand, a network engineer at Auburn University in Auburn, Ala. "It takes a little time to set up the initial table, but once you've done that, point, click and you've loaded TCP/IP on the desktop."

Previously, TCP/IP installs required the administrator to manually load the four to 10 disks on each PC.

New with 4.1

NetWare 4.1 features will include the following:

- Simplified maintenance of NetWare Directory Services (NDS).
- NetSync, which allows centralized administration of NetWare 3 and 4 servers.
- Support of System Fault Tolerance III.
- NetWare client for the Macintosh, providing direct access to NDS.

Triumph of users

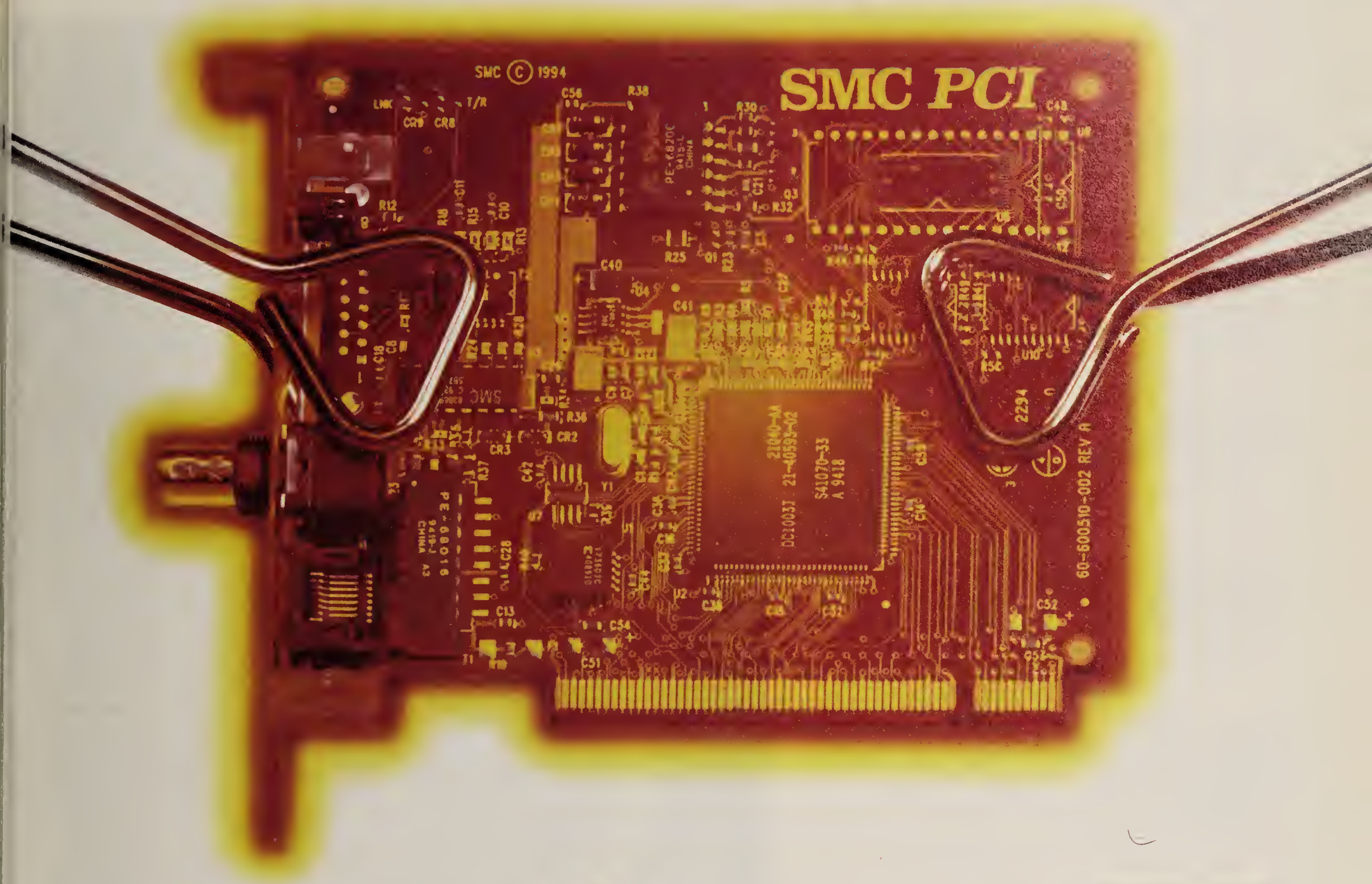
The move represents a clear victory for users, analysts said. With Novell joining the VXD/DHCP camp in TCP/IP, users should be able to manage and distribute TCP/IP data and stacks between Novell servers and Microsoft servers and clients, officials at both companies said. Novell did not put DHCP in beta versions of NetWare 4.1 this summer, meaning it was not tested by the two companies during interoperability tests with Windows 95.

At the same time, users' TCP/IP triumph also marks the impending demise of IPX/SPX. According to a recent survey of more than 50 large information systems sites conducted by Forrester Research, Inc., a Cambridge, Mass., consultancy, fewer than one quarter now have TCP/IP on their desktops today; instead they run IPX/SPX or NetBIOS. However, two-thirds said they plan to use Microsoft's TCP/IP stack when Windows 95 ships.

These statistics dovetail with TCP/IP usage plans found by Business Research Group in Newton, Mass., which estimated that 29% of the 400 senior network administrators at IS sites it surveyed use TCP/IP today and 43% will use TCP/IP on LANs by 1996.

The fate of IPX/SPX is not so rosy. The Business Research survey found that IPX support will drop off from 42% in 1994 to 35% in 1996. According to Forrester, half of its respondents said they would use Microsoft's version of IPX, bundled into the Windows 95 operating system, when it arrives. Only 13% said they would support the NetWare version.

Too hot to handle.



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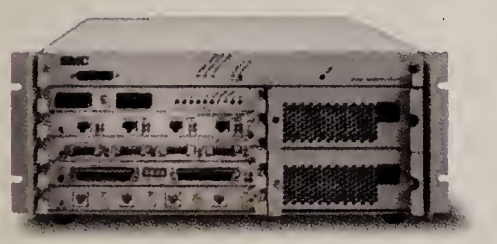

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CIOs warned to get their shops in shape

By Joseph Maglitta
TUCSON, ARIZ.

Better prove you're worth it before somebody proves you're not.

That warning echoed among the more than 600 big-company chief information officers who gathered here last week. Under growing pressure to show payoffs from billions of dollars invested in technology, attendees at the IT Economics conference were advised to get their houses in order and focus on boosting corporate profits.

"There are no internal customers, only the person who pays the bill on the outside," said Cinda A. Hallman, vice president of information systems at Du Pont Co. in Wilmington, Del.

Speaker after speaker said IS must push beyond re-engineering, total quality management and other approaches and learn new tricks. Ultimately, IS must be freed up to focus on high-value activities in sales, marketing, distribution or customer service, they said.

"The new role for the CIO is to find short-term, high-yield, revenue-contributing factors," said Akram Yosri, a lecturer at New York University's Information Technology Institute.

He said technology investments that do not directly contribute to the bottom line should be cut or outsourced.

Corporations are taking different roads to that end, including the following:

• Du Pont has slashed annual IS spending from $1.2 billion in 1989 to $770 million — a 40% cut. The $38 billion manufacturer cut IS head count from 7,000 to 4,800 and merged nearly 200 data centers into 40, according to Hallman.

Du Pont's Cinda A. Hallman *says nearly 200 data centers were merged into 40*

Now, IS can move away from cost-cutting and work on integrating customers and suppliers, she said.

• Del Monte Foods has been aggressively creating a Top 20 plan to develop specific IS programs for its top customers and suppliers and pursuing alliances outside company walls, said David A. MacPherson, CIO and vice president. The firm also outsources data centers to Electronic Data Systems Corp.

Consumer satisfaction indexes keep IS efforts on track, MacPherson said, while benefits from re-engineering projects fund new projects.

• J. P. Morgan Co. is focusing on business alignment, metries and outsoureing to keep up with new brokerage products and global expansion. It had better; IS accounts for 35% of the firm's annual expense, said Dominick J. Landi, managing director of technology production services.

What's hot

Based on an informal consensus of conference speakers and attendees, the following are hot: time-boxed projects, fast payoffs, user-developed applications, strong CEO participation, just-in-time training, focus on information, technology backbones and architecture, adding business value, soft metrics, off-the-shelf software, reusability and rapid prototyping.

Some 67% of annual IS spending is benchmarked against best industry and internal practices, Landi said. Performance is measured in terms of cost, client, quality and cycle time. Several speakers said IS neglects what should be its biggest defense: measurement.

John Parkinson, an Ernst & Young partner, said company research showed 65% of IS resources cannot be accounted for. "IS is the most undermeasured part of the organization. Most [departments] don't know what their people are doing," he said.

Those who swear by their systems choose their language carefully.

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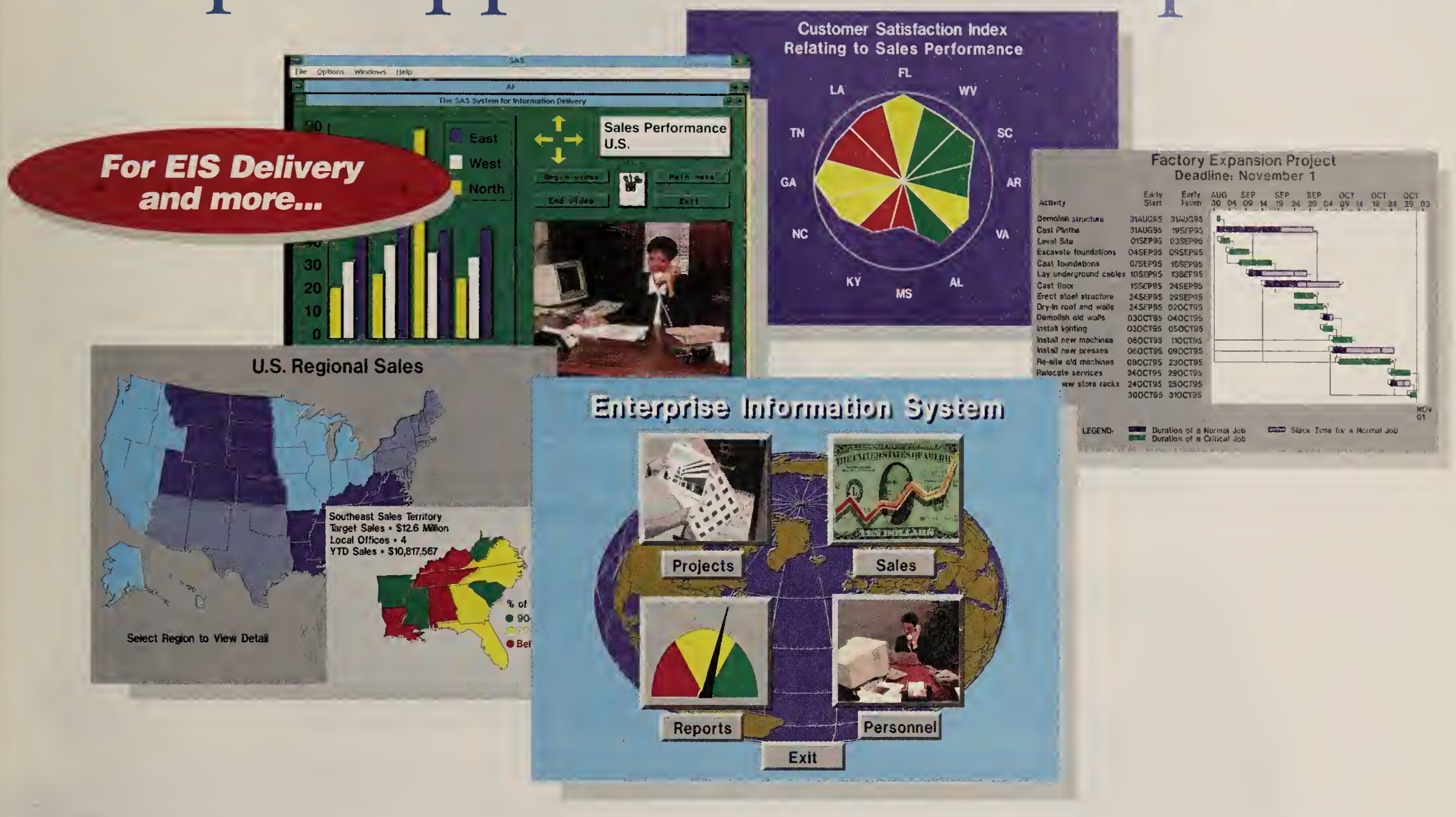

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HP 3000 sales catch market by surprise

By Mark Halper

Fiscal 1994 marked a resurgence in the proprietary Hewlett-Packard Co. HP 3000 minicomputer.

Buoyed by HP's zealous efforts to open up the HP 3000's MPE/IX operating system and by a growing realization among users that Unix is neither inexpensive nor a panacea, more HP 3000s moved out the door than either HP or its users had anticipated.

Mark Calomeni, a research and development section manager at HP's commercial systems division, last week confirmed that HP 3000 sales for the year ended Oct. 31 were "significantly above" the quota HP had established. Calomeni declined to say what that quota was.

Wall Street, which has come to expect healthy corporatewide sales growth from HP but has not counted on the HP 3000 to help fuel it, could be rethinking. "I had been forecasting that the 3000 business would decline through fiscal 1995, but it's not declining, it's growing," said Doug Van Dorsten, an analyst at Hambrecht & Quist, Inc. in San Francisco.

Steve Cooper, president of Allegro Consultants, Inc. in Redwood City, Calif., said there has been a wave of reconsideration among HP 3000 users weighing a switch to Unix.

Scott Hirsh, a data center manager at San Francisco-based investment adviser RCM Capital Management, said his company has had difficulty moving a portfolio accounting system to HP's Unix-based platform, the HP 9000, and may keep that operation on an HP 3000.

"The promise of open systems has been lower cost of ownership, but it didn't happen," Hirsh said. "There's a lot of 'gotcha.'" Among Unix's hidden costs is the expense of finding and retaining skilled Unix workers, he said.

Billy Rowland, manager of information systems at Sumitomo Electric Lightwave Corp. in Research Triangle Park, N.C., agreed.

Sumitomo has been considering moving from its two HP 3000s to a Unix system, but the company expects 98% to 99% uptime from its systems, and Rowland said he is not confident that Unix will provide that. Further, he said, systems administration "is many times more difficult" on Unix than on MPE. In short, the HP 9000 "is not as fail-safe as an MPE environment, he said."

Banner year

Hambrecht & Quist projected year-end corporatewide sales of $24.4 billion for HP, up from last year's $20.3 billion. Year-end profits will reach about $1.5 billion, Hambrecht & Quist predicted.

What's the key?

Van Dorsten said it is hard to tell whether the HP 3000's newfound success is coming at the expense of the HP 9000. The HP 3000 in general is benefiting from HP's campaign to sell HP 3000s, HP 9000s and large workstations as servers, he added.

Michael Daugherty, Knight-Ridder, Inc.'s manager of communications, agreed, citing HP's continuous efforts to add Unix interoperability to MPE/IX.

The latest version of that operating system, MPE/IX 5.0, includes Unix programmer and user interfaces prescribed by Posix 1003.1 and 1003.2 to ease the task of moving some Unix applications to MPE/IX. Posix is a set of Unix-based, IEEE operating systems standards.

But not all users have been equally impressed by this open MPE. "HP does its share of talking about opening the 3000, but I call that an oxymoron," said Sam Ellis, associate vice president of information services at Portland Community College in Oregon. "I'm not convinced the applications are as portable as some people might think."

Cooper said HP has come a long way in providing application portability. However, many Unix applications do not subscribe to Posix standards, and HP could still benefit from improving support of those programs on MPE, he said.

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META Group, February 1994 Client Survey

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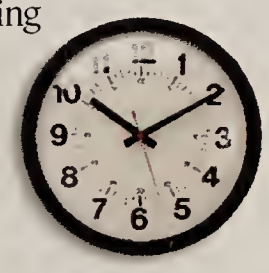

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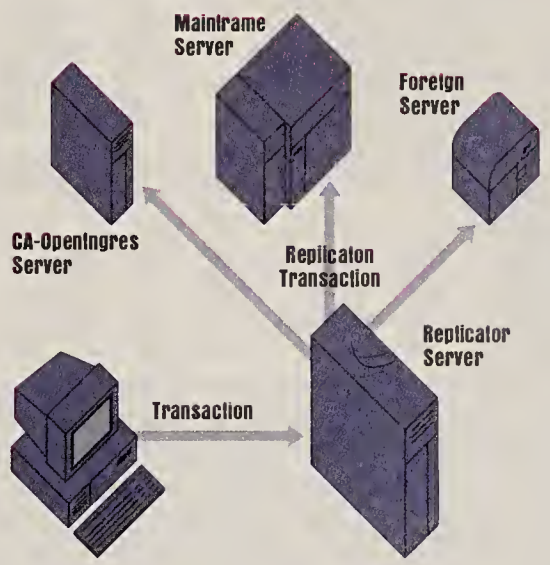

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Left for dead

CONTINUED FROM COVER 1

Wang broke the profits barrier at the end of July — its first year in the black since 1988. DG and Bull are within nine months of a profitable year, analysts said. And while Digital Equipment Corp. is still under reconstruction, even it claims fiscal 1995 profitability is coming.

Yet despite their common roots along Route 128 (see story below) — the East Coast version of Silicon Valley — each vendor took a very different path to fiscal health.

Consider customer support and professional services. For Wang, "customer service has kept [the company] afloat," said Bob Sakakeeny, an analyst at Aberdeen Group in Boston. In the past several years, Wang has quietly built a multivendor customer service business that reached 40% of revenue this year. Maintenance of Wang's VS minicomputer systems remains a large part of the company's revenue, but Wang is also scooping up maintenance contracts with PC makers such as Dell Computer Corp.

Desktop vendors find Wang's global presence and size attractive because it allows them to offer international coverage to large accounts. When Wang purchased Bull's U.S. and Canadian customer service business last month, it became the largest independent field service organization in the world, with 2,500 employees.

"They might continue to expand through smaller, more discrete acquisitions," said Scott McCready, an analyst at International Data Corp. (IDC)/Avante Technology in Framingham, Mass.

Image vs. reality

Service revenue will continue to be crucial for Wang. Although it wants to be seen as a vendor of open imaging and workflow software (with a research and development investment of $25 million), it made an unprofitable $100 million in work management sales — just 13% of revenue — in 1994. Next year, those sales are expected to increase to 40%.

At Bull, customer service is strategic outside the U.S. and accounts for 28% of worldwide revenue, which was $5.3 billion last year. But Bull will also focus on its systems integration business, a $600 million concern, 11% of worldwide sales.

Similarly, DG is bulking up its systems integration offerings. Its integration staff is now 420 strong, four times the size it was a year ago. Professional services this year saw an unprecedented rise in revenue, said Steven Milunovich, an analyst at Morgan Stanley in New York.

But unlike Wang, DG's services business is intended to sell DG equipment. "We're not there as a nonbiased integrator," said Steve Gardner, vice president of corporate marketing.

Digital is more like Wang in its services approach. Digital saw multivendor support decline in the past year by 7% — not a pretty statistic for a company that makes half its revenue there. To counter that trend, Digital has signed on with the likes of Microsoft Corp., Lotus Development Corp. and Novell, Inc. to perform leading-edge services such as electronic software distribution.

Digital blamed falling VAX sales for its services decline. And no wonder: VAXs represented just 12% of product revenue this year, a 50% decline from last year. Similarly, DG's MV minicomputers accounted for just 8.5% of revenue this year and Bull's just 2%.

Not so for Wang. Its 30,000 VS licenses still account for 40% of its revenue, and the business is declining at a modest 5% to 6% rate.

Perhaps significantly, Wang is the only one of the three to decide against building a landing pad for its minicomputer customers in an open, multiprocessor server. Instead, it dissolved its manufacturing infrastructure — second in size only to Digital's — and began reselling systems from Hewlett-Packard Co. and IBM.

In contrast, DG's Aviion servers have remade the company's fortune. Combined with Clariion storage arrays and PCs (which DG resells), the new platform accounted for 90% of product revenue this year. Aviion alone was 42%.

It helps that DG shed manufacturing costs. "Our value-add is not in making componentry but in systems software design and integration," Gardner said.

The Aviion sales were mainly 12- and 16-processor high-end systems. This is telling of DG's strategy: Focus, focus and focus some more on high-end commercial Unix servers running high-availability applications in large companies — the "Dun & Bradstreet 15,000," Gardner said. Today, IDC counts DG among the Top 4 in that market.

DG also sticks to its knitting when choosing its industries, which include health care, telecommunications/cable/media, energy, petrochemicals, local government and large chain stores. Outside of those industries, it turns to value-added resellers.

Unlike DG, Bull stayed in manufacturing, making its own line of Unix servers from 1986 until 1989. But in 1992, it began sourcing IBM's RS/6000s for its DPX/20 line. Then, in September, the firm announced its PowerPC-based Escala multiprocessor servers, codeveloped with IBM.

"It doesn't make sense in an open systems world for us to develop our own systems," said Axel LeBlois, chief executive officer at Bull HN Information Systems, Inc., the U.S. arm of Bull. But although it shared R&D with IBM, Bull builds the systems.

Big iron still rules

While Bull plans to grow its server business, open servers and software contribute just 8% to its bottom line today. It makes much more money — 27% of sales — in mainframes by selling NEC Corp. machines and redundant arrays of inexpensive disks systems. In fact, its mainframe sales grew 18% worldwide in the first half of this year.

PCs are also a major contributor to Bull's worldwide revenue at 21.5%, thanks to its Zenith Data Systems acquisition.

Bull has also turned its former minicomputer manufacturing operations into a money-maker. Bull Electronics, a contract manufacturing business, will make $350 million this year. LeBlois credits the division with staving off further revenue declines and traumatic downsizing. The group makes circuit boards for high-end PCs.

In the end, pragmatism rules. "Even if they haven't chosen the sexiest or most exciting opportunities, [each] has focused on building critical mass and market share in some of their best business opportunities," said Thomas Wilmott, an analyst at Aberdeen Group.

Wang Laboratories, Inc.

JOSEPH M. TUCCI
CEO

"If I were to do it over, I'd exit the PC business faster, and I'd give a stronger message to the VS base that we weren't abandoning them."

REVENUE	HEAD COUNT
1988*: $3 BILLION	1988*: 29,823
1994: $855 MILLION	1994: 5,200

STRATEGY SHIFT

THEN Minicomputer-based office automation systems

NOW Open work management software and multivendor customer service

*Last year of profitability

Groupe Bull

AXEL LEBLOIS
President and CEO
Bull HN Information Systems, Inc.

"In our most successful restructurings, we took drastic steps to fundamentally revise the business. Incremental change is too slow."

REVENUE	HEAD COUNT
1988*: $5.3 BILLION	1988*: 45,557
1993: $4.98 BILLION	1993: 29,000

STRATEGY SHIFT

THEN Mainframes, minicomputers and minicomputer software

NOW Mainframes, Unix servers, PCs, systems integration, merchant electronics

*Last year of profitability

Data General Corp.

RONALD L. SKATES
President and CEO

If DG could redo the past six years, "we would have pushed for higher end Aviion servers sooner. Also we would have made Clariion available for other systems environments sooner."

REVENUE	HEAD COUNT
1991*: $1.23 BILLION	1991*: 8,520**
1994: $1.1 BILLION	1994: 5,775

STRATEGY SHIFT

THEN General-purpose minicomputers

NOW Unix servers, storage, services for very large mission-critical, high-availability applications

*Last year of profitability
**Head count was 17,700 at its peak in 1984

The long and winding road to profits

SHIFTING STRATEGIES

Despite their differences, the former minicomputer vendors learned several common lessons during their long hard trek toward profitability.

Except for Data General, each cut costs by slashing its massive sales force and strengthening indirect sales.

All four companies have also had to become strict bottom-line watchers. To that end, all but DG have broken out autonomous business units responsible for profits. "Each month we compare benchmarks — not to last year but to the best in the industry," said Axel LeBlois, chief executive officer at Bull HN.

Focus is also crucial. In the past, "Wang's ratio of R&D to what was sold was terrible," said Morgan McKnight, systems engineer at Pacific Mutual Life Insurance Co. in Newport Beach, Calif. "Now, all their resources are pointed into open products. That focus has helped a lot."

Partnerships count as well. If DG made a mistake in the past, it was not forming alliances sooner, said Steve Gardner, DG's vice president of marketing. "We would have been ahead of the game faster," he said.

One last imperative, said Joseph Tucci, CEO at Wang Laboratories, Inc., is speed. "How fast you move is key," he said. — *Mary Brandel*

THE PROMISE OF WINDOWS NT HAS FINALLY BEEN DELIVERED.

Briefs

Counterfeiters fined

In a judgment handed down by Judge David Kenyon of the U.S. District Court in Los Angeles, the principals of Kanix, Inc. were ordered to pay nearly $1 million in damages to **Microsoft Corp.** for counterfeiting MS-DOS Versions 3.3, 4.01 and 5.0. Microsoft filed suit against the company in 1991 following a police raid that uncovered the illegal software.

PCS auctions heat up

More than 70 companies filed applications to participate in the **Federal Communications Commission**'s Dec. 5 auctions for broadband personal communications services licenses. Most players, such as **GTE Corp.** and **PCS Primeco L.P.**, want licenses in select areas, not all 51 trading areas.

CD sales jump

The **Software Publishers Association** last week reported that second-quarter sales of software on CD-ROM increased 421% over the same period last year. Consumer-oriented products dropped from 82% of sales last year to 63%, while business products increased from under 10% in the second quarter of 1993 to about one-third of revenue for the same period in 1994.

SHORT TAKES **Microsoft** will buy the assets of **Nextbase Ltd.**, a UK-based interactive mapping and route-planning software firm.... **General Computer Corp.** will lay off 30 employees — 15% of its workforce — as part of a restructuring plan designed to make its retail systems operation profitable.. ..Ed Koepfler, former vice president of the North American territory for **System Software Associates**, will become president and chief executive officer of **Interleaf, Inc.**... **Convergent Solutions, Inc.** has named Thomas Bosanko interim vice president and CEO following the resignation of Vincent Galano Sr.

CA, EDS divide spoils of acquisition

Former rivals share assets following purchase of banking software company

By Thomas Hoffman

Ever since Computer Associates International, Inc. and Electronic Data Systems Corp. buried the hatchet in May, it was just a matter of time before the two industry behemoths teamed up for a little game of conquer and divide.

That was the play late last month as CA completed its acquisition of The Newtrend Group L.P., an Orlando, Fla.-based banking software and services company, and then split the assets with EDS. In addition to acquiring Newtrend's outsourcing and services business through CA, EDS also purchased Miser, Miser II and Cube, Newtrend's thrift and credit union software packages.

Bank on it

Infopoint, an IBM MVS- and VSE-based suite of 20-plus banking applications, is used by 60% of the largest U.S. banks, according to Mark Combs, senior vice president of research and development at CA.

CA, which has held a 50% stake in Newtrend since 1991, will retain Infopoint, an IBM mainframe-based suite of banking applications that CA originally absorbed through its acquisition of Uccel Corp. in 1987. CA plans to reconfigure Infopoint for client/server computing platforms such as Windows and Unix, according to Mark Combs, CA's senior vice president of research and development.

CA is also evaluating how and whether to position Infopoint as a backbone engine to connect home banking products such as Microsoft Corp.'s recently acquired Quicken with leading money centers, according to Combs.

While CA and EDS officials declined to disclose the terms of the deal, analysts have placed the value of Newtrend's outsourcing and services business at $40 million — nearly half the estimated $84.2 million in total revenue that privately held Newtrend generated in 1993. Analysts project that Newtrend's revenue will rise 10% in 1994 to $92.6 million.

Some 450 Newtrend employees have transferred to EDS, while another 125 have joined CA.

Staying on course

On the surface, the deal makes sense for EDS, which already derives $1.3 billion of its $8.6 billion revenue from its financial services business. EDS plans to maintain the 10 Newtrend service bureaus it acquired. It also plans to meld the Cube software into its own credit union products, such as WorldWorks, a package EDS purchased from World Computing last year, said Jim Risser, president of EDS' financial services strategic business unit.

Industry analysts had mixed reactions to CA's plans for Infopoint. Although CA is beefing up its client/server software cache with recently developed financial, human resources and manufacturing packages, several pundits questioned Infopoint's fit with CA — a company that has traditionally focused on systems software.

"Applications software is clearly a departure from their main thrust of business. The key to Infopoint is not CA's size but [CA chairman] Charles Wang's determination to make this a viable product," said Art Gillis, president of Computer Based Solutions, a New Orleans-based consultancy.

Others analysts said they believe that a change of ownership is just what Infopoint needs to survive in a market that has become increasingly client/server-driven.

"More client/server [applications] providers are taking on the transaction processing tasks that were once the domain of Infopoint, which has drifted in irons ever since the CA/Newtrend partnership [in 1991]," noted Richard Crone, senior manager of the financial institutions consulting group at KPMG Peat Marwick in Los Angeles.

Deposits and Withdrawals

1987	1991	Jan. 1994	Oct. 1994
CA acquires Uccel and its Infopoint suite of banking applications.	CA and The Newtrend Group L.P. form joint venture and limited partnership. CA contributes Infopoint to the joint venture.	CA files a complaint in Delaware Chancery Court seeking to dissolve the joint venture.	CA acquires full ownership of Newtrend and sells off its outsourcing, services and specific software businesses to EDS.

Source: Computer Associates International, Inc. and "Bank Automation News"

Software AG launches one-stop warehousing

By Rosemary Cafasso

■ Taking a page from at least one competitor, Software AG of North America, Inc. last week launched a one-stop shopping strategy for data warehousing. The plan includes hefty consulting fees but could make users' lives easier by reducing the number of vendors needed.

Hewlett-Packard Co. has marketed a similar one-stop offering, the Intelligent Warehouse Solution, since late 1993. Most other warehousing players, such as Red Brick Systems, Prism Solutions, Inc. and Brio Technology, Inc., are instead specializing in select warehousing areas. It is too early to tell how successful either approach has been.

The Software AG plan, dubbed the Open Data Warehouse Initiative, calls for contracting with users to help them assemble warehouses with products from Software AG or other vendors. The program will include consulting services, a core database management system and tools to extract, clean and load data into the warehouse.

In addition, Software AG will provide front-end query tools, such as its own Esperant, to access warehouse data.

Data warehousing is an increasingly popular method for offloading data from production databases, storing it in an end-user database and providing tools to access the data.

"The question now from users is 'How do I do warehousing?'" said Donald Feinberg, a database analyst at Gartner Group, Inc. in Santa Clara, Calif. He said the kinds of strategies offered by Software AG and HP could remove some of the risk involved through the hand-holding and one-stop shopping approaches.

Tools, too

To coincide with the launch of the Open Data Warehouse Initiative, Software AG announced a deal with Carleton Corp., which sells tools to extract and clean up data from production databases. Software AG will resell the Carleton tools and offer primary support to users, according to a company official.

The support comes at a price, of course. Software AG officials said that a proof-of-concept contract, which is designed to help a user establish a need for a warehouse, could cost anywhere from $10,000 to $100,000 — before any actual warehousing products are installed.

The company has positioned its own database, Adabas, as the data storage piece of its warehouse offering but said it plans to remain "database-independent" and will plug in other databases that users request.

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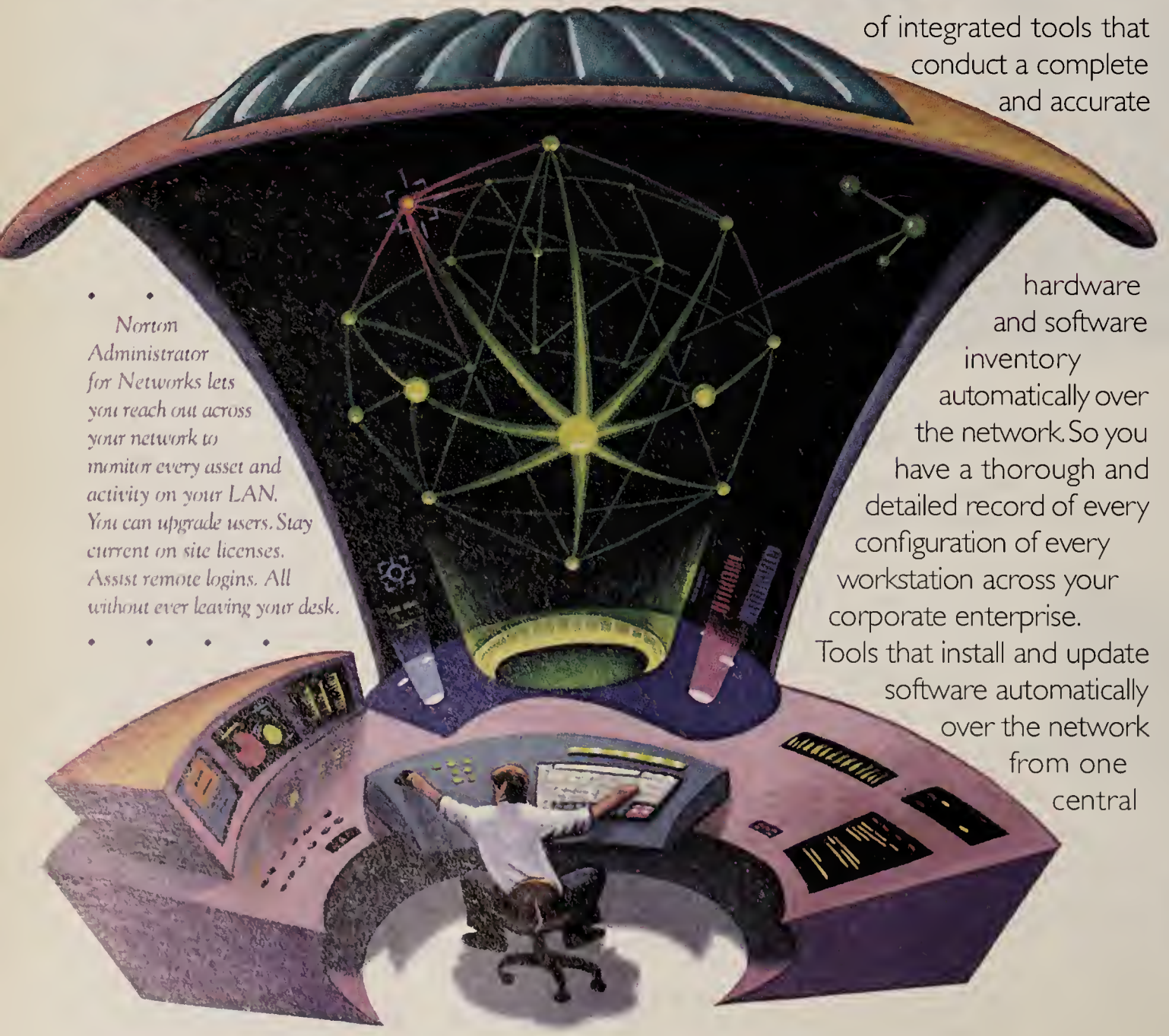

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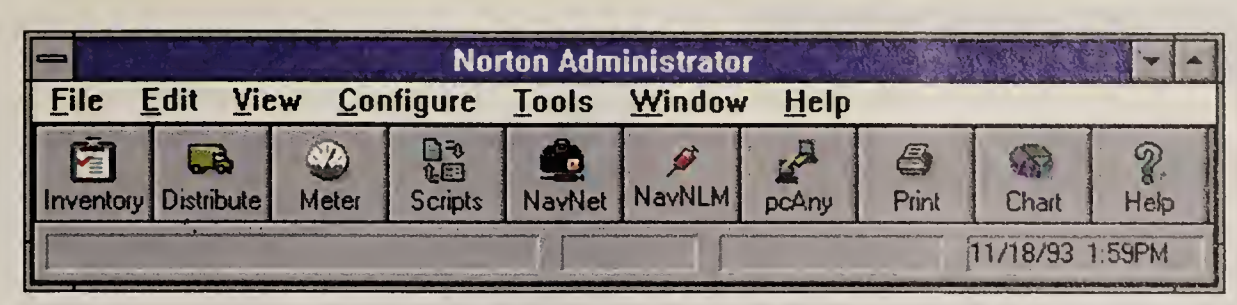

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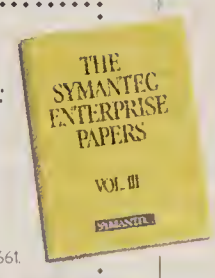

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Editorial

Impossible dream

It started about 10 years ago as a pleasant thought, evolved into a serious pursuit and eventually became, for some, an obsession: The then-MIS director could and should elevate that role and soar with the eagles of the corporate boardroom, reporting directly to the chief executive officer.

In fact, a special title — chief information officer — was coined in anticipation of this inevitable direct link to the company's top banana.

Well, it hasn't come to pass. Furthermore, there are no visible signs on the horizon that the heads of IS will ever be let out of the yoke of the chief financial officer — to whom most report — in any great numbers.

Consider the data *Computerworld* gathered in preparing the recent *Premier 100* list of the nation's most effective users of information technology. When asked the number of levels between the CIO and CEO, fewer than one in five of the companies said there were none. In about half the cases, there was one level, usually the CFO and in some cases the chief operating officer; there were two or more levels in the remaining companies.

It would be easy to conclude that the IS management community has failed, falling far short in its quest for that manifold expression of corporate respectability. Given how few CIOs are actually card-carrying members of the inner circle, I suppose the effort *has* failed.

But IS is clearly succeeding at the underlying premise of its ill-fated quest: elevating the view of IS to that of strategic partner in corporate strategy. Think, for example, of how companies such as Federal Express tout their systems expertise in "tracking our package" as the cornerstone of their success. Or how the growing number of born-again U.S. manufacturers attribute their rise to integrated systems strategies.

Consider also this nugget from our *Premier 100* data. The average number of years on the job for CIOs on this elite list is more than six years. That's not bad in an era of 25%-plus turnover in CIO ranks.

Could it be that the CIOs who maintained some distance from the CEO also paid closer attention to their technology roots rather than immersing themselves 100% in pure management issues? It seems to me the more successful CIOs I've met have never lost sight of the fact that they dwell in a technology-driven environment, one that has changed almost radically in the past five years.

It is also conceivable that the role IS management tried to carve for itself is largely an untenable one that perhaps only Superman could have filled, one that would have demanded an impossible blend of technology skills and business acumen.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *blaberis@cw.com*

Letters to the editor

Criticism 'pointless'

Ben Rothke's "Microsoft's operating system no longer on top" [CW, Oct. 24] amounted to trees slaughtered for pointless commentary.

The industry is well aware of the shortcomings of MS-DOS. Though it isn't a perfect operating system, it is affordable and doesn't require the user to invest more money.

As for Microsoft not being a "leader in operating systems," Windows NT 3.5 has all the functionality of Unix and is downward-compatible with all previous Windows 3.1 and MS-DOS business applications. So you can run Windows NT 3.5 and have a graphical user interface, security, auditing, scalability and the ability to run different subsystems; Unix to do the same thing, as long as an emulation layer is used; or OS/2 and have no security, auditing and scalability or downward compatibility until Windows 95 is released.

It has taken Microsoft seven years to do what has taken Unix more than 20. Microsoft is a leader in operating system development.

Bill Cannistra
Columbus, Ohio

I did not find Ben Rothke's commentary enlightening, interesting or useful. Bill Gates deserves his billions, not for technical superiority but for combining decent technology with brilliant business and marketing prowess.

That MS-DOS is crippled is a 1985 discussion. No one who believes in a free-market society should still be arguing about the motivations or capabilities of Microsoft.

Steve Tompsett
New York

My reactions to Ben Rothke's column varied from confusion to disgust. Microsoft ships DOS because thousands of developers wrote thousands of programs purchased by millions of consumers.

Linux is unknown to the normal user. After you install it, try buying some software to actually use this "advanced operating system."

Any self-respecting software company would love to have anything that sold 40 million or more copies. Technically superior products that flunk in the marketplace are not superior. They are flops.

Chuck Beyer
Redwood City, Calif.

No. 1 task

"Strike while the iron is hot" [CW, Oct. 17] says the future for data modelers is secure because "even in the object world, organizations still need to understand their data flows and relationships."

This doesn't go far enough: My experience in using object technology showed me that data modeling is easily the most important task in designing object-oriented systems. Unlike procedural programming, in which flow of control is paramount, object-oriented technology requires the developer to design while focusing on relationships between entities.

It is this shift of focus from control to relationship that actually increases the value of data-modeling skills in an object-oriented world.

Mark Vermette
Austin, Texas

Criminal databases are not that simple

"Data debased" [CW, Oct. 10] states that the American Medical Association, the American Bar Association, the American Civil Liberties Union and other groups "seek to screw the victim and protect the criminal." What evidence do you have to support such an accusation?

Publishing a list of child molesters may seem simple on the surface, but is it? Do we list only those convicted? What do you say to the parent whose child was molested by a known molester who had never been convicted? If you list accused persons, how would you feel about being on the list if your ex-wife accuses you?

Society must deal with reconciling ideas of individual privacy with the availability of information collected on individuals. Inflammatory editorials that trivialize the problem do not advance the dialogue.

Dante Williams
Roekridge Baths, Va.

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Middleware warfare

Ted Lewis

The number of departmental servers from Compaq, Apple, IBM, Dell and Hewlett-Packard have been growing like free trials on the Internet for the past two years. With an annual growth rate of 60%, the number of units shipped this year should top 1.5 million.

While pale in comparison to the number of Windows 95 units (the next version of Windows) that Microsoft expects to ship next year, these numbers have not gone unnoticed by the jogging suits of Redmond or the blue suits of White Plains. Servers mean a foothold in the lucrative corporate market. This is why the middleware wars are about to rage. Middleware? What does middleware have to do with the hardware buying habits of information technology managers?

Middleware is any ill-defined layer of faceless software that connects your PC to your data warehouse. It is a broad category of software ranging from transaction processing monitors to database management system gateways. Whether you use Open Database Connectivity from Microsoft or LinkWorks from Digital, you are a middleware user. It is not widely recognized by everyone, but middleware is coming center stage in the fight between the ruffians led by Microsoft and the establishment led by IBM (Component Integration Laboratories has many members including IBM, WordPerfect, Apple and others). The reason is that domination of middleware means domination of client/server architecture. That's a nice place to be if you want to control standards for the next decade.

Even Microsoft appears a bit surprised by the intensity of the battle over middleware standards. OLE and its underpinning, Common Object Model (COM), are no technical match for CI Labs' OpenDoc/System Object Model (SOM) proposal for how to glue together client/server software. Microsoft was surprised because so many software developers have jumped onto the OLE/COM bandwagon, instead of the technically correct SOM. The developers are hoping to ride on Microsoft's coattails as corporations shift into client/server high gear. Remember, Microsoft expects Windows NT 3.5 to muscle in on the server side of client/server. If successful, software developer logic says Microsoft will pave the way for third-party developers to reap profits on client/server applications riding on top of OLE/COM.

Microsoft has a hot potato in its lap because OLE/COM is being jostled into hostile territory by developers.

But OLE/COM is no match for OpenDoc/SOM. For one thing, COM was never designed to be client/server middleware. Even though Digital and Candle have entered the fray to make COM interoperate with OMG's CORBA standard for distributed objects, OLE/ COM will require major enhancements to make it powerful enough to use in the next generation of applications. Microsoft has a hot potato in its lap because OLE/COM is being jostled into hostile territory by developers.

It is interesting that once again Microsoft has touched a computing nerve, somewhat serendipidously, with little effort. If only it could be as clever in the technical arena.

Lewis is chairman of computer science at the Naval Postgraduate School in Monterey, Calif., and editor in chief of *Computer* magazine. He can be reached on the Internet at tlewis@eworld.com.

Mobile computing raises bar for enterprise apps

John Gantz

Twenty years ago, when I was a bushy-tailed analyst just starting out, companies wrestled daily with the conflict between decentralized computing and source data processing and the need for development and operational rigor in enterprise applications.

They are still wrestling. It's PCs on LANs rather than Cobol-crunching terminals connected to 300 bit/sec. SNA networks, but the issues are the same. Now companies face a truly formidable challenge — managing all this while the computers move around.

The penalty for not getting serious about field-force automation is going up.

The advent of full-function notebook computers, batteries that last a full eight-hour shift and, soon, low-power Intel Pentium chips ensure that the temptations to implement true enterprise applications on mobile computers — such as sales automation, auditing, maintenance and repair — just won't go away.

In the past month, I've been crisscrossing the U.S. talking with information technology professionals and end-user department managers about mobile field-force automation, describing the results of a major study my company conducted on the subject for Dell. What I learned from the research and the trip will scare you.

For one, the penalty for not getting serious about field-force automation is going up. A good 25% of the organizations I interviewed claimed to be getting significant competitive advantage as a result of their efforts. In some cases, these companies could point to order-processing rates that were cut in half, sales made in two visits instead of four or customer satisfaction ratings that jumped by double digits. This kind of automation can make a difference.

On the other hand, the research found a lot more field automation projects fell short of expectations than exceeded them. This is tough stuff.

While many of the success factors for well-implemented applications are self-evident — such as engendering top management support — some are not. Information technology organizations routinely underestimate the field force's ability to resist change or ignore applications that don't directly benefit them. Training always ends up taking weeks instead of days; line departments often balk at pulling top producers out of the field to put on cross-functional teams; hardware and software vendors are often unable to install their products in the places and quantities needed.

These are problems faced in desk-based applications, but mobile computers compound the problem. Help desks must stay open for after-hours support; product selection is tricky because notebook computers are less modular than desktop machines; training and installations must be arranged by appointment.

Here's my action plan:

- **Bone up.** Talk to peer companies and spend time figuring out what they did right or wrong.
- **Double whatever time and money you plan to spend getting feedback from the field.** This will make for a better application and serve internal marketing functions.
- **Overbuild.** The organizations that were getting a competitive advantage from field-force automation said the key to ongoing success was rapid upgrading.
- **Grill your vendors on how they can help you with logistics and financing.** For example, can they transfer software from old machines to new ones and dispose of the old gear? Can they install your custom-built software along with special shrink-wrapped bundles at the factory?

This can be a high payoff application worth many times the investment. But field-force automation is Murphy's stomping ground. You can't protect yourself with a Nerf gun.

Gantz is senior vice president at International Data Corp. in Framingham, Mass. He is responsible for all research and consulting in desktop automation and workgroup and office computing.

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Moving to client/server? You'd better beware

By Rebecca Bailin

There have been so many stories of client/server success and horror — can there still be more to say? Apparently, there is.

Our favorite story has been that of a very large and well-known corporation that was slated to go client/server with the following training plan: First take lifelong Cobol programmers, train them

for one week (count it, one week) in C, and then get them going on a client/server application, writing the front-end GUI in native C. We're not talking about Microsoft's Visual Basic, Gupta's SQLWindows or PowerSoft's PowerBuilder; this was going to be programming for those who don't eat quiche. The justification for using native C was better performance. But remember that if the system never gets written, the performance is really bad.

The client/server caveat is that this transition will take longer than you think, and it will be harder for your staff than you can imagine. Ten percent to 15% of your staff will embrace the "new world" and make significant contributions. Another 10% to 15% of your staff will stonewall — with 5% engaging in subtle sabotage. Of the balance, half will grow productive over time, and half will limp along and never be really creative.

It is clear that the enormity of the mind-set shift (shall we say that phrase, paradigm shift) in a client/server move remains unappreciated. Consider the following:

- **Flat-file or hierarchical-to-relational databases.** It's astonishing how difficult this transition seems to be. Relational databases aren't just a different type of file, they're a completely different way of solving business problems. In traditional systems, the brains are in the code. The programmer thinks through problems and solves them in code. In relational databases, the maintainability, flexibility, simplicity and capability rest in how the database structures are, well, related.
- **Procedural to event-driven.** In traditional systems, the programmer, again, thinks through the problem and solves it in code. When the code is complete, it walks the user through the solution, asking for user involvement at the time and in the manner the programmer intended. In event-driven GUIs, the developer provides a solution tool. Instead of the programmer solving a business problem, the designer creates an environment in which the user solves the problem.
- **Design intensive vs. syntax intensive.** In the traditional environment, the programmer learned the syntax of the language to express an algorithm that would solve a business problem. With today's GUI tools, the programmer assembles prefabricated blocks — metaphors that represent business activities. The usability of the system is completely dependent on the programmer's facility with metaphors. It is amazing how many companies think they can save training dollars by giving programmers a week of PowerBuilder coding classes while ignoring design training. Syntax is no longer the point; it is structure and design.
- **Single point of failure vs. a zillion points of failure.** It is frightening how little attention is given to network infrastructure and support. Moreover, the management style must change in order to manage these essentially different kinds of systems. Throw out all your assumptions about systems management and plan to start again.

So if your management thinks the client/server transition is a good idea because it will save money on hardware, they had better think again. It may be an excellent idea, but if saving hardware dollars is the fundamental cost justification — without giving thought to transition costs such as training — make sure management has my phone number. I'd like to sell them some very nice ocean-front property in Nebraska.

Bailin is president of Lumin Corp., a consulting firm in Mill Valley, Calif.

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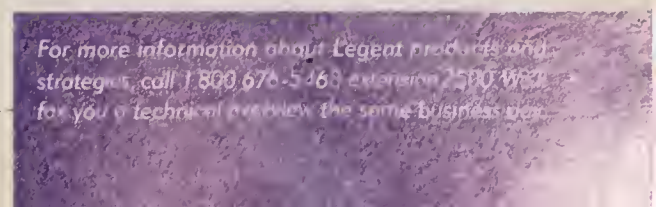

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Notebooks just keep getting better

Increased hard drive sizes, moves to color screens portend bigger changes for coming year

By Michael Fitzgerald

■ The market for notebook computers continues to swell, and some observers say we are headed for what may be a golden age of technical development in the market.

"We're getting into a cycle of performance innovation that may be unprecedented," said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass. "I'm gushing here, but it's just that good in the market now."

closer LOOK notebooks

More developments are expected even beyond the past year's breakthroughs, which include a near-total move to color screens; the advent of built-in audio, sometimes in stereo; dramatic increases in hard drive size that should produce 1G-byte drives in notebooks next year; and new form factors, such as the slim notebook and the subnotebook.

Next year's breakthroughs

A recent spate of announcements foreshadows broad technology trends for next year as well, observers say. A sampling of these products and the vendors offering them include the following:

- Built-in, full-size CD-ROM drives (IBM, Panasonic Personal Computer Co. and Aquiline Systems, Inc.).
- Lithium ion batteries (Toshiba America Information Systems, Inc. and Dell Computer Corp.).
- Screens with 800- by 600-pixel resolution and true color (NEC Technologies, Inc.).
- Intel Corp. Pentium systems (Toshiba, NEC and others soon to follow).
- Infrared communications (Hewlett-Packard Co. and IBM).

These technologies are expected to become widespread in the first half of next year as vendors rush new models to market. In particular, Pentium and lithium ion batteries should be featured prominently, analysts say.

Other developments will include screens larger than today's 10.4-in. maximum.

Users say advances in notebook development are mostly welcome, though no one relishes the idea of his hardware becoming obsolete six months after purchase.

"All the developments are spectacular," said Victor E. Mutnick, corporate vice president at New York Life Insurance Co. "The weight and size is coming down, and the performance is going up at the same time. Just keeping on that curve is what everybody wants to have happen."

Mutnick said he is particularly interested in Pentium, though not because it promises to run faster. "The extra megahertz isn't a benefit to anybody [for today's applications], but I'm excited about Pentium because I see it as [taking us over] the threshold of improving the user interface."

He said that longer term, he expects to see handwriting recognition and voice recognition become an important part of the feature sets in applications.

Vendors agreed but said voice recognition and other "natural" interface technologies are probably a late 1995 development.

"Voice hasn't yet found its way into anybody's critical set of technologies," said Rob Howe, vice president of worldwide marketing at AT&T Global Information Solutions. He said the technology still falls short of its promise.

No more shortages

Supply problems, users' main bane this year, may disappear, too. Most vendors and analysts expect to get all the screens they need, which could result in pricing cuts in a market in which high-end products today can hit $8,000.

IBM's ThinkPad 755C encapsulates *new technologies such as infrared and CD-ROM, which should become standard in notebooks*

The market may also see some new players enter with significant technology, which should drive innovation and give users more choices. HP, for instance, will release its first full-size notebook computers this week and add some nifty features such as instant-on capabilities to its 3.8-pound OmniBook subnotebooks. Digital Equipment Corp. is also preparing a run at the market, with new notebooks designed to run more effectively on networks.

Another hot area should be PC Cards, which fit into slots in notebooks that meet the PCMCIA standard. PC Cards, which act as desktop add-in boards for notebooks, draw a lot of user interest.

"We want to see things that we can do within our current hardware infrastructure without going broke," such as Integrated Services Digital Network (ISDN) capabilities in a PCMCIA form factor, said Michael Radigan, a program manager at Xerox Corp. in Rochester, N.Y.

The PCMCIA's new PC Card Standard, which will be announced today, should boost PC Cards in the market. One of the standard's key features is its ability to support multiple cards in one package, which allows vendors to build, say, a modem and a LAN adapter card in the same package. These sorts of multifunction PC Cards should give users guaranteed compatibility when they use cards and may also lead to new features such as ISDN.

One part of the portable market that could get ugly is subnotebooks. Vendors are publicly reevaluating their strategies for this market. AST Research, Inc., for example, announced a subnotebook and later killed it.

"There has been slower acceptance of subnotebooks than we would have expected," said Maurice Fletcher, manager of mobile computer brand marketing at IBM PC Co.

'Shrinking' trend

Fletcher said the trend toward more form factors this year, which saw the growth of subnotebooks and the "slim" notebooks, will probably mean at least one addition by year's end. He said the new category will combine several attributes of other categories, condensing full-size notebook features into a smaller package.

Along those lines, he declined to comment on reports that IBM will release a new product in January that combines the ThinkPad 510 subnotebook with a 10.4-in. screen and a keyboard that pops out to make it full-size.

Observers said the mid-1995 introduction of Microsoft Corp.'s Windows 95, the next generation of Windows featuring plug-and-play abilities, will be a boon for notebook users.

Packaging issues, such as integrating various types of applications on a system or building in more modularity, may also become prevalent.

According to Stephen, "There will be a real closing of the performance differential between desktops and notebooks in the next six months."

A battery of improvements

Though notebook batteries are getting better, users are not seeing the improvement in terms of longer battery life because of some fundamental issues in system design: Vendors tend to cram in new features at every possible opportunity.

Still, 1995 could be a year of fundamental change in the notebook battery market. Intelligent batteries as well as operating systems and applications built with power management in mind should help, but the big change may come from a shift to new technology.

The market appears tilted toward lithium ion, which generates much longer battery life than today's nickel cadmium and nickel metal hydride technology. Toshiba and Dell are the first two vendors to use lithium ion batteries in their portable products. Dell's new high-end Latitude XP has shown some arresting increases in battery life, such as achieving six hours for an active-matrix color notebook in full use.

Other competitive technologies include lithium polymer and zinc air oxides, but analysts say lithium ion may be the winner.

"Lithium ion may win out more from fear than anything else," said Brian M. Barnett, director of battery industry studies at Arthur D. Little, Inc., a consultancy in Cambridge, Mass. Barnett said Dell's and Toshiba's success with lithium ion may force other vendors to "feel they have to respond."

Meanwhile, pricing and capacity issues continue to roil the battery waters. AER Energy Resources, Inc. is pushing a new zinc air-based battery that offers runtime similar to that of lithium ion, but it presents both capacity (it lasts only 50 charge cycles vs. up to 500 for nickel metal hydride) and design issues because zinc air batteries need access to oxygen to create the reaction that generates power for the notebook. —*Michael Fitzgerald*

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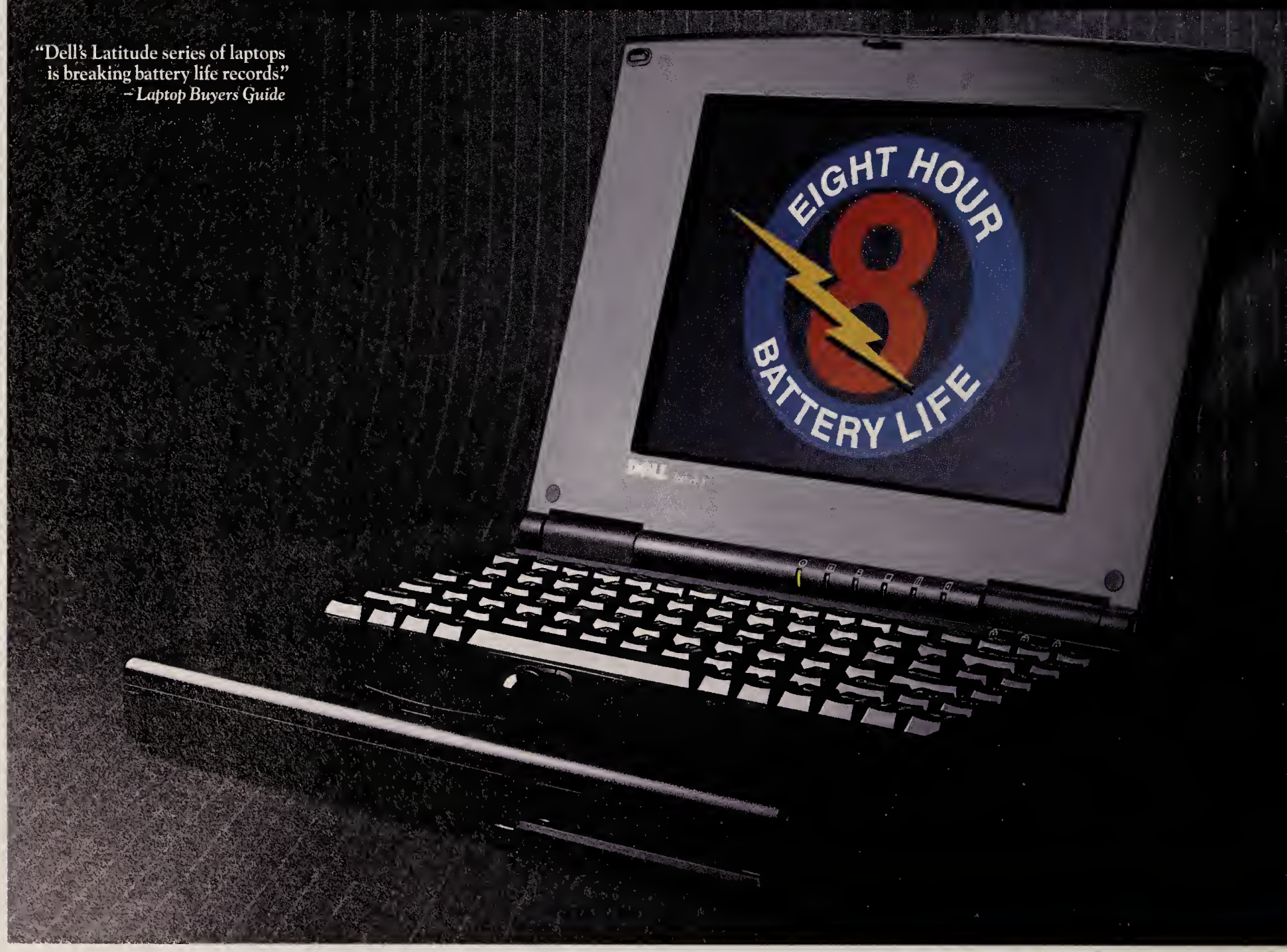

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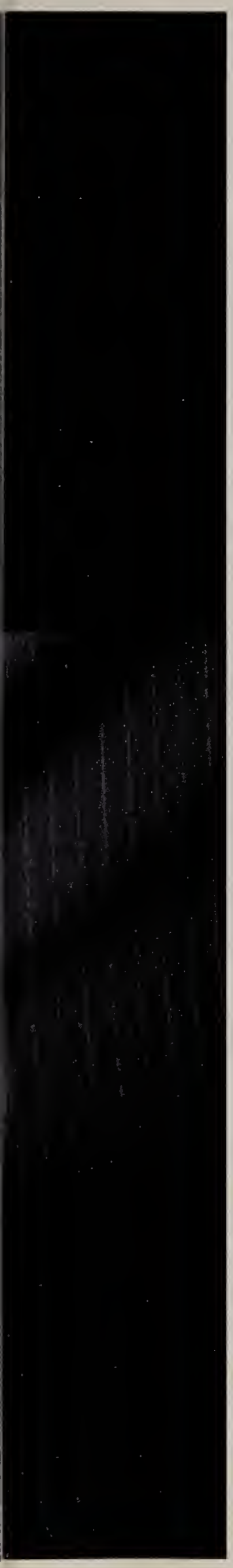

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Intel challenges Apple on telephony front

By Mark Halper

Where there is a computing will, there is often more than one computing way. That is the scenario unfolding as Apple Computer, Inc. and Intel Corp. battle to improve the way computers and telephonic devices work together in the digital age.

Most information systems practioners agree that today's highly charged PCs and telecommunications equipment are limited in their companionship in many ways, among them the following:

- Modems connecting the two still receive only analog signals and thus cannot take direct advantage of the high speeds afforded by the digital private branch exchanges in place at most firms.
- Those modems typically connect to CPUs through dated serial interfaces that restrict transfer rates to 14.4K or 19.2K bit/sec.
- No standard exists to connect the myriad phones, fax machines, telephone answering systems and other devices around the world with desktop computers and their diverse collection of I/O and system buses (see related story page 63).

In the nascent Intel/Apple fight to overcome these shortcomings, the early lead goes to Apple, which has been building what it calls a Geoport interface into Macintoshes for more than a year. Geoport was designed to allow transfer rates of up to 2M bit/sec., according to Apple business manager Mark Orr. Apple is also marketing an adapter for that interface that converts analog input into digital signals.

But for Geoport to work its magic, device makers must build new products with Geoport interfaces or users must purchase from Apple an adapter that ties existing devices into Geoport.

Orr declined to say how many adapters Apple has sold, and Geoport devices have not been flooding the market; Apple offers a digital camera that ties into Geoport, but Geoport telephony devices have been slow to emerge, observers said.

Not alone

Apple appeared to gain an advantage last month when nine vendors, including IBM's computer group and AT&T Corp.'s communications operations, endorsed the technology. Neither IBM nor AT&T gave specifics about implementing it, and such firms will also have to decide whether to back Intel's forthcoming competing technology, called Serial Bus.

Jim Burton, chief executive officer at Boston consulting firm C-T Link, Inc., said Geoport is an "enabling technology" but not a be-all and end-all to correcting telephony shortcomings. "There is a competitive effort coming from Intel, and there will be a battle over which architecture is supported by whom," Burton said.

Intel will not offer Serial Bus chips until sometime next year, according to Jim Pappas, Serial Bus program manager at Intel Architecture Labs in Hillsboro, Ore. But those chips will provide a minimum 5M bit/sec. performance, he said.

Like Apple, Intel is lining up support from some heavy hitters: Compaq Computer Corp. and Microsoft Corp. are helping it develop Serial Bus, Pappas said.

For its part, Microsoft plans to support Intel's Serial Bus in a future release of Windows, said Microsoft product manager Charles Fitzgerald. That support will come from the inclusion of Microsoft's Telephony Application Programming Interface in its latest version of Windows, Windows 95, a move that will provide drivers for Serial Bus.

"We did an analysis of Geoport, and our conclusion was it did not solve the complete set of problems we were trying to solve," Fitzgerald said.

Serial Bus will do a better job of alleviating the unwieldy multiple connections required to link not only telephony devices but all sorts of low-speed peripherals to a CPU, Fitzgerald explained. Serial Bus is intended to allow users to string devices off each other in a daisy-chain configuration that requires just one attachment to the CPU, he said.

Meanwhile, Geoport backers shrugged off the threat of Serial Bus, noting that Intel has yet to deliver and that Geoport is more than a year old.

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Plug and Play makes strides

Hardware and software vendors take 'first baby steps' toward the standard

By Jaikumar Vijayan

The effort to create plug-and-play systems is well under way. Slightly more than 20 months after Microsoft Corp. and Intel Corp. presented the first general framework for the standard, a host of new hardware and software specifications promises to make plug-and-play systems widely available by mid-1995.

Plug and Play — basically a set of PC architecture specifications — is an effort by hardware and software vendors to design intelligence into PCs to handle installation and configuration tasks automatically and without user intervention.

With a plug-and-play system, users can install devices into or remove them from a desktop or mobile PC; dock and undock notebook computers from a docking station or desktop PCs from a network; and optimally configure the system for different applications without modifying configuration parameters or expansion-card jumper settings.

"The whole thing is about ease of use. A couple of years from now, people are going to forget about Plug and Play" because it will be taken for granted, said Ted Julian, an analyst at International Data Corp. in Framingham, Mass. "That's the beauty of simplicity."

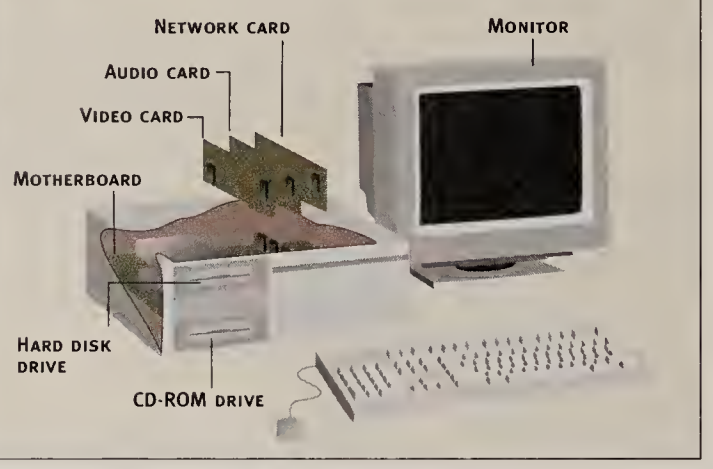
Already, a number of hardware and software vendors have begun putting together products that Julian called the "first baby steps in the right direction."

Plug and Play aplenty

Apart from Microsoft and Intel, which have spearheaded efforts to define plug-and-play standards, more than 20 major vendors have plug-and-play-enabled products on the market, including Compaq Computer Corp., IBM PC Co., Dell Computer Corp., AST Research, Inc., Zenith Data Systems, BIOS vendor Phoenix Technologies Ltd. and Adaptec, Inc.

These include products such as audio and video cards and communication cards that can be slipped into existing systems with little tweaking. Also, plug-and-play-enabled mobile systems that allow users to dock and undock their systems while running active applications have already been demonstrated and could become widely available in the market by the first quarter of next year.

Plug and Play As disparate system elements comply with the standard, users can more easily upgrade or add features



But analysts agreed not all components of true Plug and Play are here yet.

"Several desktop vendors are already supporting Plug and Play at least partially ... and others are definitely headed in that direction," but full functionality has not yet been achieved, said Jennifer Munson, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

While several devices, such as PCMCIA, Peripheral Component Interconnect and IBM's Micro Channel Architecture, are largely plug-and-play-ready, a majority of the installed hardware base still requires hardware and software tweaks to conform to plug-and-play specifications.

Additional plug-and-play specifications for BIOS as well as SCSI and integrated drive electronics devices have been released by a joint industry forum called Open Process, but plug-and-play devices based on these specs are not expected until mid-1995, analysts said.

Windows 95 to give impetus

Most observers predict that next year's release of Microsoft's Windows 95, its next generation of Windows, could spur the rapid adoption of the standard by hardware vendors. The release will include several new components to provide greater plug-and-play compatibility.

Users seem to be waiting for vendors to show that Plug and Play is real. "I'll be willing to listen when the vendors really have something to say" about Plug and Play, said Douglas Murphy, director of MIS at Comcast Corp. in Philadelphia.

"I don't think Plug and Play has happened as yet. No one here talks about it as an issue, and so far it sounds like Plug and Play will mainly help the consumer market a lot," said Michael Purcell, a software engineer at Baxter Healthcare Corp. in McGaw Park, Ill. Plug and Play has had little relevance so far in Baxter's largely standardized and preconfigured hardware environment, he said, but he did not rule out its potential.

Driving the need for the technology, analysts said, is the growing popularity of new peripherals such as CD-ROM and sound and full-motion video devices as well as the proliferation of mobile computing, which may involve plugging and unplugging laptops and notebooks from corporate networks and peripherals.

Vendors release spate of Pentium-based systems

By Jaikumar Vijayan

The sluggish corporate response to Intel Corp.'s Pentium processors has not kept vendors from rushing to market products based on the high-end chip.

Last week, for instance, Gateway 2000, Inc. announced one of the industry's first desktop systems based on the 100-MHz Pentium. On the heels of that announcement, NEC Technologies, Inc. today will announce Image Pentium, uniprocessor and dual-processor systems based on 90- and 100-MHz Pentiums.

Other vendors to introduce Pentium-based products include Dell Computer Corp. and Tadpole Technology, Inc. in Austin, Texas. Tadpole will release today the first 100-MHz Pentium-based notebook, while Dell announced last week the first 128-bit Peripheral Component Interconnect (PCI) local bus video controller for high-speed business graphics on its high-end Pentium lines.

The announcements come amid signs that despite low corporate demand, the market for Pentium-based systems could improve substantially in the fourth quarter, mainly in the retail and consumer channels.

Just the facts

Gateway's P5-100XL multimedia system, priced from $4,299, is based on the 100-MHz Pentium and features a quadruple-speed CD-ROM drive, a 17-in. monitor, 16-bit wave table sound cards, speakers, 16M bytes of RAM, a 1G-byte hard disk and a PCI local bus video card. NEC's Image Pentium line has 13 configurations, including dual-processor and multimedia systems. Prices start at under $2,500 for a uniprocessor model.

A recent report from Wall Street brokerage S. G. Warburg & Co., for instance, predicted that despite lower-than-anticipated shipments, Pentium could actually see its sales double in the fourth quarter from purchases by small businesses and power users. Major corporate demand for Pentium, however, is not expected until at least mid-1995, analysts said.

"Next year is going to be a year for Pentium," predicted Martin Reynolds, an analyst at Computer Intelligence InfoCorp in Cupertino, Calif. "Vendors want to make sure they have the right products in the market when that happens."

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INTRODUCING 1-2-3 RELEASE 5. NOW THE LEGENDARY SPREADSHEET BRINGS MORE PEOPLE TO THE NUMBERS AND THE NUMBERS TO LIFE.

1-2-3® has always helped individuals become more productive. Now it goes to a new realm—workgroup productivity. With strengthened ties to Lotus Notes® and new, sophisticated routing features, workgroups are using 1-2-3 Release 5 to make decisions, reach consensus and explore possibilities.

No other spreadsheet has the features of 1-2-3 Release 5. Features that make everyday spreadsheet tasks easier. Features that help you move from task to task fluidly. Maximum productivity, minimum effort.

TAP THE POWER OF NOTES WHEN YOU'RE IN 1-2-3. TAP THE POWER OF 1-2-3 WHEN YOU'RE IN NOTES.

Say you're working on the annual budget in 1-2-3. You can save your spreadsheet in Notes. Then share ideas and information with colleagues working on the same budget at the same time.

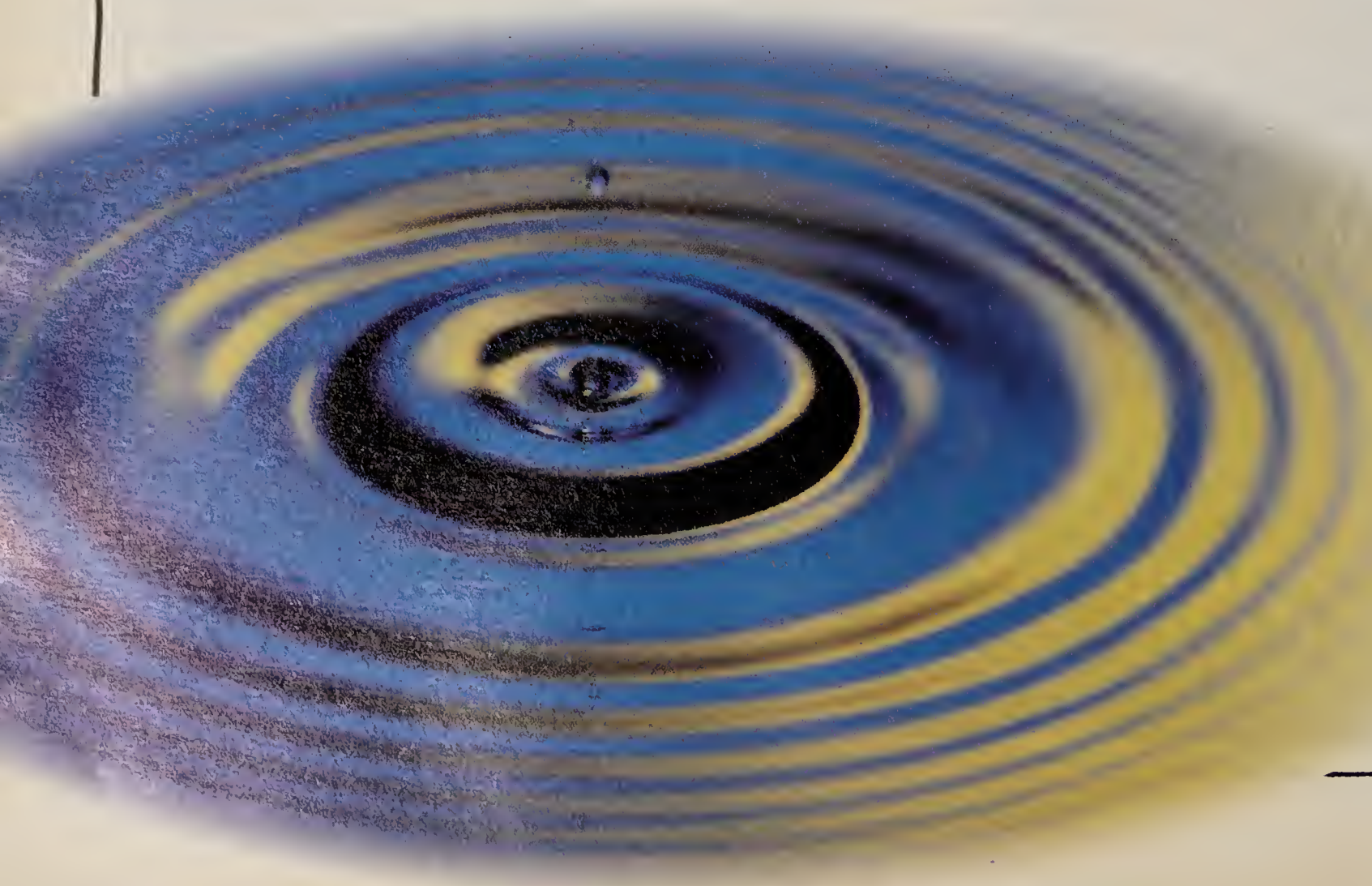
Lotus NOTES READY™

Any changes to your spreadsheet are automatically synchronized and distributed thanks to Notes replication technology. Plus Notes' security protects the integrity of your data.

When you're working in Notes and want to crunch numbers, prepare budgets or perform "what-if" analyses, you can launch into 1-2-3 with Notes/FX™ 1.1—to get the power of 1-2-3 right in your Notes application.

Notes/FX goes beyond OLE to provide you with a dynamic two-way exchange of key information between Notes and

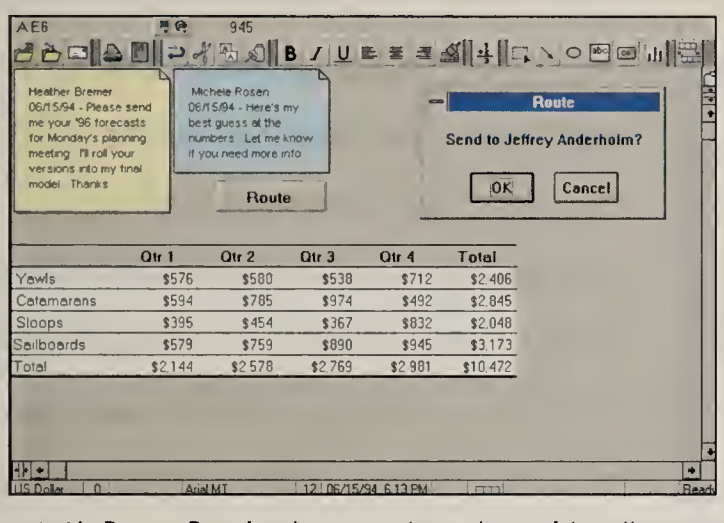
freedom of MOVEMENT, NOT chains of COMMAND.



1-2-3. So you can roll that 1-2-3 information back into any Notes application.

POWERFUL WORKGROUP FEATURES EVEN WITHOUT NOTES.

1-2-3's powerful Version Manager™ lets each person in your workgroup save multiple sets of charts to any name range. So you know the who, what, when and why of every change all the time.



1-2-3's Range Routing lets you share data with colleagues—sequentially or all at once—collecting their comments and input into a single document.

Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to work-group members for input, track progress, then roll everyone's ideas back into your file, complete with comments and changes tracked as versions.

1-2-3 Release 5 worksheets and ranges can be routed using either VIM or MAPI based e-mail and can be routed either serially or in parallel.

MAXIMUM PRODUCTIVITY, MINIMUM EFFORT.

1-2-3 Release 5 is packed with innovative new features designed to help you get more done with less effort.

SmartMasters™ are predesigned and customizable templates of everyday business forms—like expense reports, invoices and purchase orders—with built-in intelligence to guide you through common tasks in record time. Or create custom SmartMasters for yourself or your workgroup.

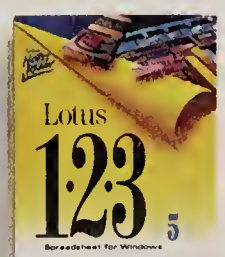
With Lotus Maps you can create instant maps of geo-graphic data. Select a range of data and watch 1-2-3 Release 5 create the appropriate map with color-coding based on data ranges. 1-2-3 Release 5 ships with maps for the world by country, U.S. by state, Canada by province, Europe, Mexico, Japan, Taiwan and Australia.

1-2-3 Release 5 features seamless integration with Lotus Approach® database to easily create data entry forms and generate reports and mailing labels.

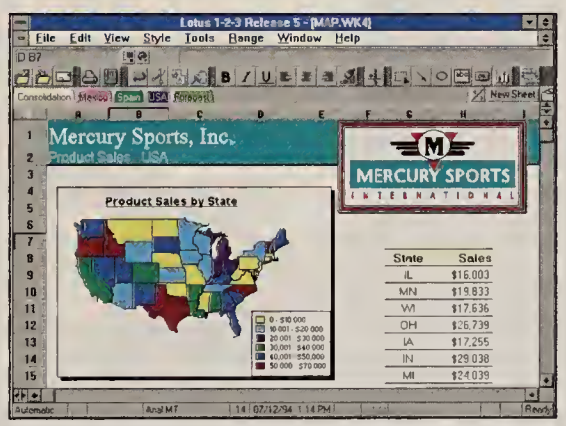
With Fast Format you can apply the formatting you've designed for one range to any other range in the worksheet — with one click of the mouse.

One-Step Charting lets you build a chart complete with labels, titles and legends, all in a single step.

Drag-and-Fill fills in ranges from other documents in just one step. And our improved OLE 2.0 Drag-and-Drop lets you move copy or data across worksheets or files fast.



Multi-page Print Preview lets you view up to nine spread-sheets on your screen before you print.



1-2-3 Release 5 features Lotus Maps. It's the easiest, most effective way to analyze your spreadsheet data geographically.

Taken all together, the new 1-2-3 is loaded with enhancements that make get-ting the job done a whole lot easier—alone or in a workgroup. And 1-2-3 Release 5 gives you the best compatibility with 1-2-3 for DOS of any spreadsheet. To learn more about 1-2-3 Release 5, visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. 8801** for a free demo disk. A 1-2-3 upgrade costs $119.**

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Working Together®

NEW SMARTSUITE 3.0. A MAJOR RELEASE TO HELP YOU AND YOUR TEAM WORK TOGETHER.

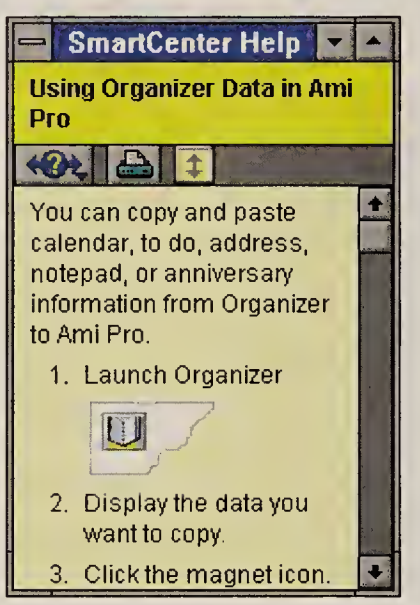
To work better people need powerful desktop applications, built for both individual and team productivity. SmartSuite® 3.0 is exactly that. It's the best suite for this new way of working because it's the only suite built to optimize Lotus Notes.

The applications that make up SmartSuite have been upgraded in some very important ways—so they work harder and work together better than ever.

1-2-3 Release 5 is packed with new features like SmartMasters spreadsheets templates, Lotus Maps for geographic visuals of data, Smart Assistants to guide you, seamless integration with Approach database, Range Routing for mailing spreadsheet ranges, OLE 2.0 Drag-and-Drop, and, of course, Lotus Notes Integration.

The new Lotus Approach 3.0 offers unprecedented ease-of-use, PowerClick™ reporting, X10™ technology (our new, exclusive, speed-optimized architecture) and the easiest-to-design forms, mailing labels and crosstabs on the market.

Lotus Ami Pro® offers powerfully fast word processing (49% faster than Word, 103% faster than WordPerfect®†), low memory/hard disk requirements (4MB RAM, 19MB for complete installation), with proofing tools, collapsible click-and-drag outlining, revision marking, powerful macro language and automatic list renumbering. There are over 55 predesigned style sheets for memos, faxes, reports and more. Built-in charting & in-context drawing tools. Ami Pro also seamlessly imports documents from other word processors.



Help Card, one of SmartSuite's powerful help tools, guides you through cross-application tasks.

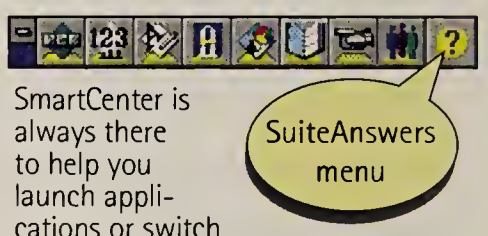
Freelance Graphics® 2.1 features task and industry specific SmartMasters, a unique 3-step process to create presentations, charting and drawing, presentation management and improved import/export capabilities.

And Organizer™ 1.1 offers easy linking for cross-referencing, flexible printing, group scheduling and nifty integration with Ami Pro so you can create monthly calendars in Ami Pro from Organizer appointments.

SMARTSUITE 3.0 IS A BETTER INTEGRATED SUITE ACROSS THE BOARD.

The integration in SmartSuite begins with a consistent look and feel across applications—they share a common user interface, menus, SmartIcons® and a Live Status Bar.

SmartCenter, the headquarters for cross-application services, is always there to help you switch or launch applications. You can customize its icon palette into the configuration that's most convenient for you.



SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you-all you do is point.

SuiteAnswers are cross-application help tools which include a SmartSuite Guided Tour and task-oriented Help Cards—plus the new ScreenCam™ for creating audio/visual "screen movies." It's the only help service in Windows™ that stays up as you move between applications.

Smart Assistants are your step-by-step guide through common tasks.

And our powerful 1-2-3/Approach database integration lets you analyze and

format 1-2-3 data, taking full advantage of Approach's easy-to-use forms and reports, dynamic crosstabs to pivot rows and columns and tools for creating summaries or viewing data in several formats.

SMARTSUITE, THE NOTESREADY SUITE, EXTENDS THE DESKTOP TO THE WORKGROUP.

SmartSuite 3.0 includes powerful workgroup enhancements. But for an even higher level of workgroup capability, just add Lotus Notes and see what happens:

Combined with Lotus Notes, 1-2-3 Release 5 becomes a model management system that lets team members search a library of worksheets.

Add Notes to Ami Pro 3.1 and it becomes a real "workgroup processor." Use the built-in Notes database for efficient, secure document sharing and tracking. And you can format your Notes or cc:Mail® messages directly in Ami Pro.

Approach 3.0, the top-rated Windows database, becomes a shared reporting, forms and analysis tool. Its advanced integration with Lotus Notes lets you build sophisticated, information-intensive workgroup applications and join Notes data to other types of databases, from dBASE to SQL.

And Freelance Graphics 2.1, used with Notes, becomes a presentation storage system, a library of past presentations, which a team can browse and pull from to create new ones.

For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. 8802** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus NOTES READY™

the COMMITTEE IS dead. long live the TEAM.

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SMARTSUITE 3.0

SmartCenter
(to move between applications)

SmartMasters
(for predesigned templates)

Fast Format
(apply styles throughout documents)

ScreenCam
(to put your ideas in motion)

Smart Assistants
(to guide you)

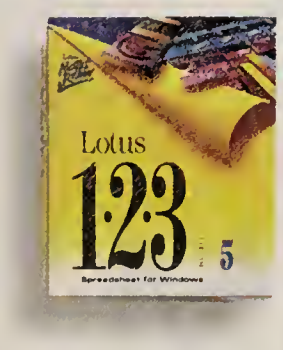
Configurable Single Install
(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY™

1-2-3 RELEASE 5 SPREADSHEET



SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0 DATABASE

PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

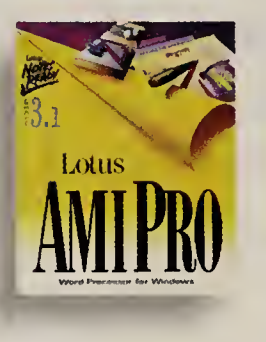
X10 Speed Architecture
(for blazing speed)

Lotus 1-2-3 Integration
(for working with 1-2-3)

PowerKey™ Technology
(for direct access to existing data)

Dynamic Crosstabs
(for drag-and-drop analysis)

AMI PRO 3.1 WORD PROCESSOR



New Proofing Tools
(for easy document proofing)

Collapsible Click-And-Drag Outlining
(simplifies organization)

Revision Marking
(edit documents without confusion)

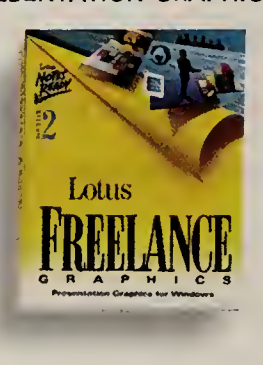
New Style Sheets
(more professionally designed templates than ever)

Text Styling
(make your e-mail look better)

WordPerfect Switchkit®
(the move from DOS is painless)

Stick-It Notes
(add comments and messages)

FREELANCE GRAPHICS 2.1 PRESENTATION GRAPHICS



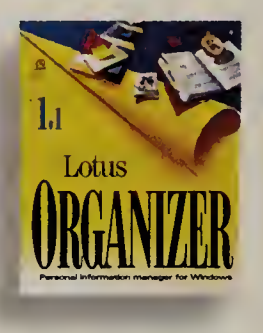
Unique Three-Step Process
(for quick and easy presentations)

One-Click Charting
(access a library of charts and drawings with one click)

Page Sorter
(presentation management at a glance— review and rearrange with ease)

Import/Export
(more file formats than ever— including Harvard/DOS and PowerPoint® 3.0)

ORGANIZER 1.1 PERSONAL INFORMATION MANAGER



Easy Linking
(makes cross-referencing simple)

Flexible Printing
(for your manual planner, mailing labels from your address book)

Group Scheduling
(use with cc:Mail to set up meetings with anyone on your WAN or LAN)

Real Time Access
(instantly view co-workers' busy and free time)

how the NEW SMARTSUITE 3.0 HELPS workgroups work.

The new SmartSuite 3.0. Featuring major new releases of 1-2-3, Ami Pro, Approach database and Freelance Graphics—plus the popular and powerful personal information manager Organizer—this is the ultimate integration of your most important desktop tools. For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. 8802** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

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*In Canada call 1-800-GO-LOTUS. **$119 qualified upgrade price direct from Lotus. †NSTL, May 1994. ††$299 promotional price available while supplies last. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes, 1-2-3, Approach, Ami Pro, cc:Mail, Freelance Graphics, SmartSuite, SmartIcons and Working Together are registered trademarks and ScreenCam, PowerClick, Notes/FX, Version Manager, SmartMasters, Organizer, PowerKey, X10 and NotesReady are trademarks of Lotus Development Corporation. WordPerfect and Switchkit are registered trademarks of WordPerfect Corporation. PowerPoint is a registered trademark and Windows is a trademark of Microsoft Corporation. Paradox is a registered trademark of Borland International, Inc.

Cascade to market archiving system

By Elizabeth Heichler
LONDON

Cascade Systems Ltd. in the UK will soon deliver a new library and archiving system for publishers that permits natural language searches of text, images, audio and video. The company claims it will make it easier to republish information electronically and on CD-ROM.

MediaSphere 1.0 combines Adobe Systems, Inc.'s Acrobat document exchange software and Sybase, Inc.'s relational database management system with a natural language search engine developed by Cascade. The engine takes information directly from electronic production systems and automatically indexes that information prior to archiving it on a Sun Microsystems Computer Corp. SPARCserver.

Users at Macintosh or Windows client workstations can then search and retrieve material in its original context and with associated material. For example, users can view an article on the page as it was printed along with a related photo or graphic. Audit trails of all searches are automatically produced.

Acrobat 2.0's Portable Document Format (PDF) is the key technology that allows users to view, navigate and print the information stored in MediaSphere, regardless of the system or format in which it was produced.

Rather than use Acrobat's Boolean text searching mechanism, however, MediaSphere incorporates a proprietary, non-Boolean probabilistic search engine. This engine allows users to enter queries in natural language, and then it ranks retrieved documents, suggests other associative search words and locates other potentially relevant documents.

When searching the MediaSphere database, users tag all the graphic representations of pages, editions and elements they would like to examine more closely. When an item is selected for viewing, the system launches Acrobat, and the user is presented with a PDF file that contains the information in its original type style and layout, including graphics.

The Sybase relational database management system manages the status and location of all information in the archiving system. It tracks users and data movement and provides controls and security.

Making a pitch

The system is being aimed at organizations that collect, collate, package and distribute information, with initial pitches being made to publishing companies, according to Cascade. The company said it is discussing customization of the system with potential users in the UK and the U.S., and it expects to ship its first completely integrated system before the end of the year.

For publishers that want to republish existing information via electronic delivery channels, the MediaSphere system can be extended to allow direct creation of CD-ROMs as well as access via the Internet, according to Cascade.

Prices vary depending on configuration, but they start at roughly $64,000 to $112,000 for the software.

Cascade was formed in September 1993 and is based in Needham Market, England, with its U.S. unit, Cascade Systems, Inc., in Andover, Mass. Cascade received a $1 million-plus cash infusion from Adobe's venture capital arm, Adobe Ventures, in July.

Cascade was Adobe's first Acrobat systems integrator for Europe, and its customers include several UK newspaper companies as well as *Newsday* in the U.S.

Heichler writes for IDG News Service.

New Products

Adobe Systems, Inc. has announced Persuasion 3.0, graphical software for managing slides, overheads and PC-based presentations.

According to the Mountain View, Calif., company, Persuasion 3.0 includes an enhanced user interface and additional color models and graphical tools.

Features include movable palettes, charting and precision control tools and "autojump," which lets users interrupt a presentation and branch to another slide or application.

Persuasion 3.0 costs $495.

▶ *Adobe Systems*
(415) 961-4400

Alpha Software Corp. has announced Alpha Five for Windows, a relational database.

According to the Burlington, Mass., company, Alpha Five includes field rules for data entry that can assign new customer numbers incrementally, even with multiple operators, automatically capitalize first letters of name fields and fill in prices from multiple separate files.

Features include a banded report writer that provides unlimited report styles, a built-in text editor, allowance for multiple views of the same data at one time, drag-and-drop application building and Xbasic, a database programming language for developers.

Prices start at $149.

▶ *Alpha Software*
(617) 229-2924

Digital Video Arts Ltd. has announced NewWorld Operating Environment 4.0.

According to the Dresher, Pa., company, NewWorld Operating Environment 4.0 provides full-screen, full-motion playback of Indeo video files in Windows.

The product features a Wave audio driver to improve audio/video synchronization and eliminate add-in sound cards for audio playback on most Windows applications. Audio, high-resolution still images, graphics and animation can also be presented with the product.

The NewWorld Operating Environment 4.0 costs $199 and comes with the NewWorld Toolkit of video, audio and image capture tools.

▶ *Digital Video Arts*
(215) 576-7920

TouchStone Software Corp. has announced WinCheckIt, a Windows problem-solver.

According to the Huntington Beach, Calif., company, WinCheckIt includes an uninstaller, a cleanup facility that deletes unneeded files, a memory optimizer that consolidates Windows memory fragments, a system file editor that lets users edit or restore data from prior versions of systems files and special DOS utilities that reuse critical system files.

Testing features include performance tracking, searching for hardware changes and operating system changes and a comparison between setup configurations and actual configurations. A software shopper function matches software specifications data to actual configuration data.

WinCheckIt costs $59.

▶ *TouchStone Software*
(714) 969-7746

Lexmark International, Inc. has announced the Optra family of 1,200- by 1,200 dot/in. laser printers.

According to the Lexington, Ky., company, the Optra family features an enhanced laser print engine, reformulated toner, built-in PCL5 and Adobe Systems, Inc. PostScript Level 2 emulation, two internal network adapter slots and a network printing utility.

Print speeds range from 8 page/min. in 1,200 dot/in. mode or 12 to 16 page/min. in 300 and 600 dot/in. mode. The printers accept a range of media, including card stock, labels, transparencies and heavy papers.

Prices range from $1,749 to $3,699

▶ *Lexmark International*
(606) 232-2000

Eastman Kodak Co. has unveiled the XLS 8600 PS printer, a thermal dye printer.

According to the Rochester, N.Y., company, the XLS 8600 PS handles both Adobe Systems, Inc. PostScript Level 2 and raster image files. The printer comes with Macintosh and Windows system drivers, provides Kodak's UltraColor color rendering and enables simultaneous printing and processing.

The XLS 8600 PS costs $9,995.

▶ *Eastman Kodak*
(716) 724-4000

Cirrus Logic, Inc. has announced CL-GD5440, CL-PX4072 and CL-GD7542, multimedia video playback devices for desktop and portable PCs.

According to the Fremont, Calif., company, CL-GD5440 is an LCD VGA controller that allows computer-generated digital information to be displayed on a standard television or VCR for recording.

The CL-PX4072 accelerator enhances video input from CD-ROM or disk-based files. The CL-GD7542 processor converts analog video signals to digital signals for display of TV-quality video on a PC.

Prices range from $35 to $45.

▶ *Cirrus Logic*
(510) 623-8300

Focus Electronic Corp. has announced the Focus Signature Series, alternative computer keyboards.

According to the Walnut, Calif., company, the baseline model contains a wave shape for typing comfort and an oversized U-shaped spacebar and enlarged backspace key. Other models include a trackball, a built-in calculator and 12 programmable function keys.

Prices start at $29.

▶ *Focus Electronic*
(909) 468-5533

NEC Technologies, Inc. has announced the MultiSpin 4X series CD-ROM readers.

According to the Wood Dale, Ill., company, all MultiSpin 4X readers are equipped with 256K bytes of continuous flow cache for fast access of frequently used information. The series includes external, internal and portable models.

Prices start at $415.

▶ *NEC Technologies*
(708) 860-9500

The Math Works, Inc. has announced Matlab 4.2c for Windows, mathematical software.

According to the Natick, Mass., company, Matlab 4.2c for Windows provides a Notebook Suite that integrates Matlab with Microsoft Corp.'s Word 6.0. It also offers support for 16-bit graphics boards and clipping of Metafiles.

Prices start at $1,695.

▶ *The Math Works*
(508) 653-1415

Product shorts

Actix Systems, Inc. has announced the GraphicsEngine Ultra 64, a graphics accelerator. The 4M-byte video card for Peripheral Component Interconnect local bus provides sharp real-time video and intricate graphic images at 1,204- by 768-pixel resolution and a 75-MHz refresh rate. Cost: $529. Actix Systems, Santa Clara, Calif. (408) 986-1625 .... **Tatung Company of America, Inc.** has announced touch-screen options for Tatung's 14-, 17- and 20-in. PC and Macintosh monitors. The monitors will incorporate MicroTouch Systems, Inc.'s ClearTek screen sensor technology. Cost: ranges from $345 to $2,500. Tatung Company of America, Long Beach, Calif. (213) 979-7055.

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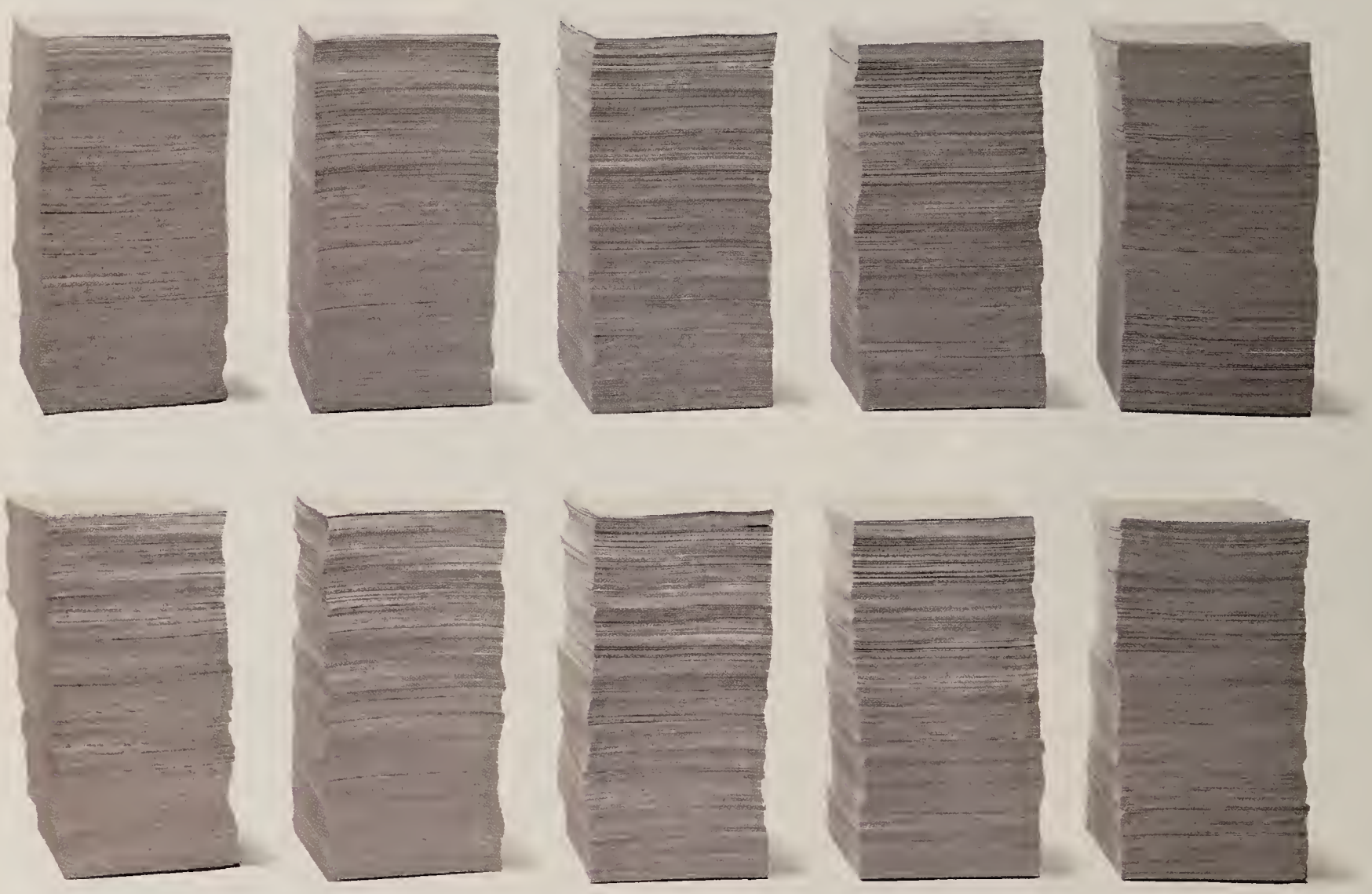

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SmartSuite for OS/2 enhanced

By Ed Scannell

■ Responding to user complaints about the lack of equity in its Windows version of SmartSuite, Lotus Development Corp. has released a new version of SmartSuite for OS/2 designed to better exploit IBM's 32-bit operating system.

The new suite of 32-bit applications — made up of improved versions of 1-2-3, Ami Pro, CC:Mail and Freelance — features tighter integration with OS/2 Workplace Shell for many drag-and-drop functions.

A feature making its debut in SmartSuite 1.1 is the Lotus Application Manager that, working in concert with the Workplace Shell, makes it easier to switch among the SmartSuite applications, Notes and an OS/2 window.

Long-needed enhancements

"Some of these improvements are long overdue. But what they have done does make it more competitive with [SmartSuite for] Windows. But the question as always with OS/2 apps is, is it too late?" said Bill Mason, senior analyst at Nevada Power Co. in Reno, Nev.

"It is important that Lotus has done a decent job upgrading this version. The whole OS/2 desktop market needs a boost right now," said John Handy, a technical consultant at a utility in Gaithersburg, Md.

To make it easier for SmartSuite for OS/2 users to exchange data with SmartSuite for Windows users, Lotus tweaked the interface, including SmartIcons, on some of the OS/2 applications.

"In redesigning some of the applications, I think we are showing a commitment to the promise of cross-platform development," said Dave Laverty, director of SmartSuite Marketing at Lotus.

New capabilities

The integration improvements with the Workplace Shell allow users to drag and drop individual files, such as a 1-2-3 spreadsheet or Ami Pro documents, to a printer or shredder. They can also double-click on any icon that represents an individual file to load both the file and application where it resides.

The new versions of 1-2-3 and Freelance are now Vendor-Independent Messaging mail-enabled as well as provide support for IBM's Configuration, Installation and Distribution technology. This allows LAN administrators to install the two applications from a central site to unattended remote PCs.

System requirements for SmartSuite for OS/2 are a 386SX-based system with a minimum of 12M bytes of memory. CC:Mail requires a CC:Mail Platform Pack for OS/2.

SmartSuite for OS/2 will be available next month through resellers and carries a promotional retail price of $795. Any user of a Lotus spreadsheet, word processor, presentation graphics or electronic-mail product for DOS, Windows and OS/2 can purchase an upgrade for $595.

For a limited time, users buying SmartSuite for OS/2 will receive a free copy of OS/2 2.1.

Lotus bundles SmartSuite, Notes

By William Brandel

Many vendors talk about delivering "networkable applications" to users. But with its latest bundling of Notes and SmartSuite 3.0 into one package, Lotus Development Corp. is taking a leadership role in delivering on the promise of shareable software programs.

Lotus is now offering NotesSuite, an array of bundles of the Notes client — and in some cases the Notes server — with its SmartSuite 3.0 application suite. This is not just another mindless bundling of applications that are now marketed in a new way. The grouping of Notes and SmartSuite is actually viewed as a step forward in the application suites wave. NotesSuite will demonstrate to users how SmartSuite 3.0 will behave on an application server platform, Notes.

Grouping advantages

Moreover, the grouping will also demonstrate the benefits users will gain by buying and using Notes and SmartSuite together. If the new suite works as well in practice as it does in theory, it will enable users to develop macros and programs for one common application programming interface (API) set, which will work on both the desktop and in the Notes environment.

"The attractive part of this for us is the integration of application features," said Kevin Caine, manager of personal productivity at Progressive Insurance Corp. in Cleveland. Caine said Progressive has been using Notes in-house since 1990, and it standardized on SmartSuite on the desktop last year.

"There is a lot of potential when you start looking at devcloping an application on Notes that is integrated with SmartSuite or the other way around," Caine said. "We can store spreadsheet

NotesSuite, *page 60*

NotesSuite packaging:

Starter kit
- Choice of Notes Server, NetWare Loadable Module, OS/2, Windows NT, Unix
- 2 Notes Windows clients
- 2 copies of SmartSuite for Windows
- NotesSuite Application Collection
- Estimated price: $995

NotesSuite License Packs and PassPort program
- 1 Notes client
- 1 SmartSuite
- Estimated price (quantity of 100): $499

Champions Program
- $698 for two-day training and Notes Starter Pack

A desktop jack-of-all-trades

Digital's Multia combines NT, Unix and manageability

By Mary Brandel

It's a PC. No, it's an X Window System terminal. No, it's a terminal emulator.

Actually, it's Digital Equipment Corp.'s Alpha AXP-based Multia MultiClient Desktop, which the company introduced last week. The system runs PC applications locally under Microsoft Corp.'s Windows NT Workstation Version 3.5.

But it also lets users access Unix applications over the X Windows protocol and host applications through terminal emulation software, according to Digital.

And unlike PCs, users download all applications and files from a server when they want to run them and put them back when they are through.

"DEC has integrated a number of tools and software onto a good fast platform, plus added a nice, easy-to-use front end to mask [complexity] and make it all look like a single package," said Steve Kleynhaus, an analyst at Meta Group, Inc. in Westport, Conn.

"That sounds like where we're tending to head," said David Frost, senior group manager of information technology at Becton Dickinson Research Center in Research Triangle Park, N.C. The center plans to buy some Alpha-based PCs for engineers to run NT applications.

Two boxes in one

At the same time, the engineers still need to use VMS, Frost said, and the scientists need to run Unix. A Multia machine would solve the problem of having two boxes on one desk.

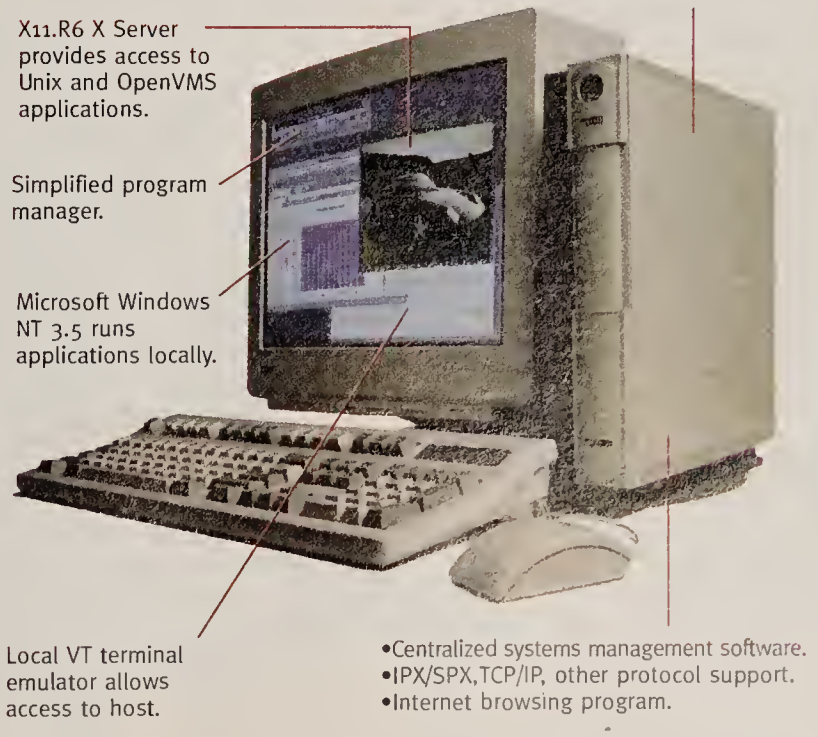
Digital's devices are well priced compared with X terminals, said Eileen O'Brien, a director at International Data Corp. in Framingham, Mass.

But some analysts said they do not expect Multia to sweep PCs off desktops on a grand scale. "If they sell 100,000 units in the next 12 months, they'll be thrilled," said Mark Litvinoff, PC service director at Gartner Group, Inc. in Stamford, Conn.

Multia, *page 60*

NOT EXACTLY A PC

Digital's Multia is intended for PC users who need wide access and central management control



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Boole & Babbage leaps into distributed management

By Suruchi Mohan

Boole & Babbage, Inc. has entered the fray with Computer Associates International, Inc.'s CA-Unicenter by announcing its Ensign line of Unix systems administration and management tools.

The Ensign line of products offers centralized and distributed management tools. It includes three products: Central Manager, which, as the name implies, manages systems from a single console; Local Manager, which was designed to handle only one system; and Alarm Manager, which performs event surveillance and notification functions.

Although centralized management, based on the mainframe model, has been around for a while, the prevalence of Unix in the enterprise has expanded the model to include distributed management. "Distributed management has become more needed," said Richard Baker, principal at Thinking Systems Integration, Inc. in Newport Beach, Calif. "Corporate America is downsizing, the platforms chosen are often Unix, and mission-critical applications are moving to Sybase, Oracle. As companies get these [systems], the need [for distributed management] expands."

Good management

Not only corporations, but also large campuses need tools to manage their systems. Scott Swanson is a senior systems programmer at Northwestern University in Evanston, Ill. He is centrally managing an exploding number of systems at the university, but many of the departmental systems are not set up to be managed from a central site.

Swanson, who uses Sysnet from Sysnet Corp., acquired by Boole & Babbage in San Jose, Calif., earlier this year, will upgrade to the Ensign product line by year's end. Then he will give the local management of departmental systems to an operator while still performing centralized functions such as backup.

This division of management is becoming fairly commonplace. "We need a central point of control and delegation of authority," said David Wade, a senior systems programmer/analyst at General Atomic in San Diego. Wade added that divisions can handle issues such as software updates and the corporate group, software distribution and security.

Ensign's graphical user interface (GUI) has certainly made delegation to a less qualified manager easier. "The GUI version gives the ability to off-load some clerical functions an administrator might perform to someone less skilled," Baker said.

In addition to the GUI, the product line offers the following features:

- Support for character-based terminals, which are still quite common in the Unix environment.
- Simultaneous system control by both the data center and a remote site.
- Instant problem recovery through the integration of the Ensign event and administration features.
- Support for Hewlett-Packard Co.'s HP/UX, Sun Microsystems, Inc.'s Solaris, IBM's AIX and The Santa Cruz Operation's SCO Unix.

The Ensign line has a control component and an agent component, both of which can reside on either the workstation or server. The agent is available in a single-user or multiuser configuration. Pricing for a medium configuration with one control point managing 15 systems is about $30,000, and a large configuration with five control points and 75 stations is $110,000. Smaller sites with only one system can use just the Local Manager, which costs about $2,500.

NotesSuite

CONTINUED FROM PAGE 57

ranges in 1-2-3 and then present the data via the Notes database. This is all simple to do with Notes/FX."

Notes/FX is a superset API to Microsoft Corp.'s Object Linking and Embedding 2.0 that lets users share data bidirectionally between Notes and Lotus' desktop applications. By exploiting Notes/FX, NotesSuite offers common programs and help features applicable to both environments.

Called the NotesSuite Application Collection, the programs include database-stored library applications such as Freelance Presentation Library or Business Process Applications such as expense reports and workgroup documents. The suite also offers traditional Notes information services such as on-line news.

Lotus is taking a novel marketing approach to NotesSuite. Instead of simply pitching the bundles as a mass-market offering, NotesSuite is being sold in different configurations targeting corporations that want to perform pilot tests of Notes and SmartSuite, Lotus officials said.

"I don't think NotesSuite is a primary vehicle for getting customers to select Notes or SmartSuite," said David Cearley, vice president of groupware applications at Meta Group, Inc. in Stamford, Conn.

Making Notes stronger

The tighter integration of Notes and SmartSuite should help solidify Notes as an infrastructure platform for corporations, Cearley said. Another benefit for users is that the type of integration that Lotus is demonstrating with NotesSuite will put additional pressure on Microsoft to provide better integration between its suite, Office and Notes.

"The primary concern for us is to be able to have Notes compatibility and integration," Caine said. "The decision to go with Notes is completely different from the suite selection. But the more integration the suite has with Notes, for us, is the better."

Cearley acknowledged that for Notes users who are wavering between Office and SmartSuite as a desktop application set, the integration demonstrated in NotesSuite may help sway some to SmartSuite.

Tektronix aims at commercial sites with WinDD

By Jean S. Bozman

In a move to merge Microsoft Corp.'s Windows NT and Unix applications onto a single user screen, Tektronix, Inc. last week announced a new Windows NT-compatible screen display software package for X Window System terminals. Tektronix hopes to use the package to push into commercial sites, countering rivals' PC-X software that displays Unix applications on PCs, industry analysts said.

Tektronix, which is third in the worldwide X terminal market in unit shipments, hopes to expand into commercial information systems shops with its new WinDD product, analysts said. They expect the product's direct links to native Windows NT servers to run applications much faster than Windows emulation software for Unix machines and X terminals.

Development process

To develop WinDD, $1.3 billion Tektronix built on technology from Citrix Systems, Inc., said David Pinckard, director of marketing at Tektronix's Network Displays Division in Wilsonville, Ore. Citrix licenses Windows NT code, and Tektronix built extensions onto that code, he said. Tektronix said it already supports Windows PCs that run NT by reselling Hummingbird Communications Ltd.'s PC-X server software.

There are also IS benefits, analysts said. "WinDD is a cost-effective way to secure [NT server] data," said Eileen O'Brien, director of terminals research at International Data Corp. in Framingham, Mass. "The data is secure on the [NT] server, and there are no floppies on the X terminals," she said. An average Windows NT server will support 15 to 20 X terminal users, Tektronix said.

WinDD, due to be shipped in the first quarter of next year, supports the Windows NT 3.5 operating system and will support Windows 95, the next version of Windows, when that operating system ships early next year.

WinDD displays NT server applications running on Intel Corp. processors, but it can also display Unix applications on the same user screen. However, cut-and-paste functions between the Windows and Unix portions of the display screen are now limited to text only and will have to be enhanced in the next release, Tektronix said.

Many options

Target uses for WinDD include customer service and help desk applications, in which end users look up data from multiple databases while talking to customers.

A WinDD software license for one NT server and WinDD/Xpress software for 10 client X terminals costs $3,495. Additional users can be added to the system at prices ranging from $160 to $200 per user.

Analysts said they expect WinDD to outpace most Windows emulation techniques. "It is a method of running the Windows window on an X terminal without having to go through the emulation," said Bob Sakakeeny, an analyst at Aberdeen Group in Boston. He said SunSoft, Inc.'s Wabi translation product and Insignia Solutions, Inc.'s SoftWindows emulation product will run more slowly than Windows applications running in native mode on Intel PC servers.

Multia

CONTINUED FROM PAGE 57

"Right now, it's a niche product," Kleynhaus agreed. "But it has the potential to turn into something else in the future."

That something else could take shape if Digital ports the same capability onto a Pentium device or removes it from hardware all together, Kleynhaus said.

"Right now, it's a niche product. But it has the potential to turn into something else in the future."
— Steve Kleynhaus, Meta Group

That may happen, said Nina Hargus, product manager at Digital. But first there has to be a multitasking operating system — such as Windows 95 — that can run on Pentium efficiently. Windows 95 is the next generation of Windows.

What may turn PC administrators' heads is the centralized systems management software sold with Multia. The administrator can distribute software and manage the devices over the network.

The suggested price is between $3,495 and $3,995 for the system box only. With the monitor and keyboard, the street price will likely be $4,000.

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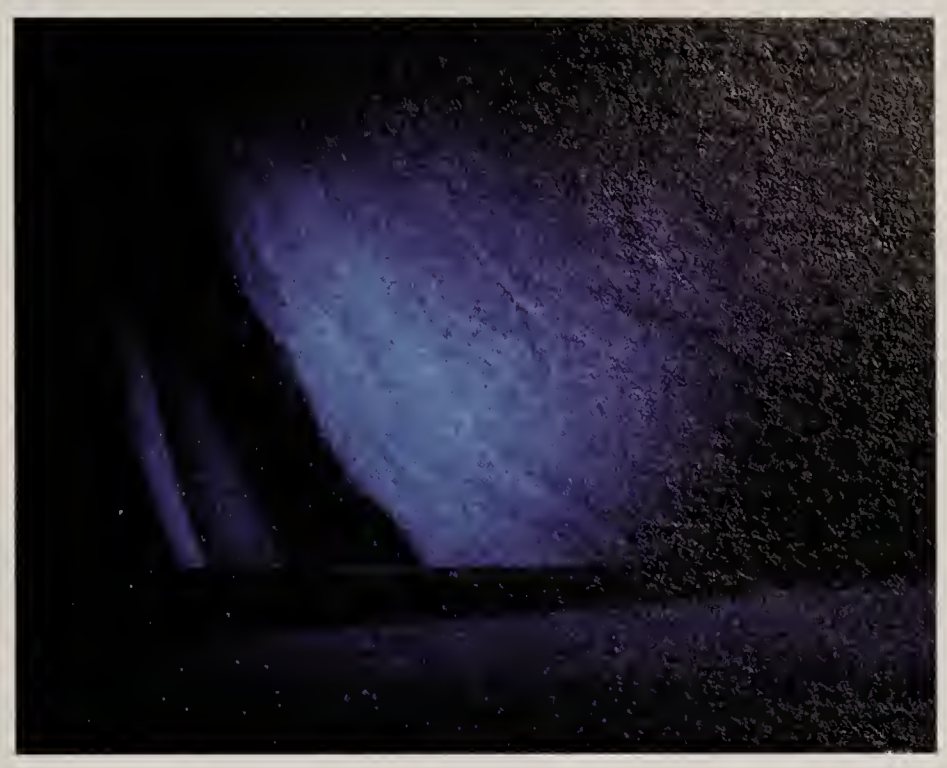

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Ambitious users tap telephony applications

By Lynda Radosevich

It is not going to hit most desktops for a couple years, pundits say, but widespread integration of PCs and telephones is happening, and precocious users are already piloting newborn telephony applications.

Computer-integrated telephony, as it is called, is what happens when telephones and computer applications communicate. This includes enabling individuals to manipulate their electronic messages using Touch-Tone phones and allowing companies to set up servers that give customers information via phones.

Large, integrated systems have been used in call centers for several years. For example, a voice-response system at a catalog company might request a caller's name and deliver the caller — with his address and credit card number — to a customer service representative.

What is different now is that desktop users are beginning to see the incremental timesaving benefits of the marriage between phones and PC applications. For instance, CNL Group, Inc., a diversified real estate investment company in Orlando, Fla., is experimenting with a system that will integrate its phone system with Lotus Development Corp.'s Notes.

All you need

The goal is to allow brokers to call in, enter a code and have information in a Notes database sent to them by fax, electronic mail or regular mail. Notes filters the requests and sends only the information that a particular agent is authorized to access, said Ron Murphy, vice president of information systems at CNL.

"We want to offer 24-hour call-in service," Murphy said. Phone Notes is one way to do so without adding 24-hour staff, he added.

Active users such as CNL are still in the minority, but the technology is ready to take off. Simul-

Telephony, *page 68*

Computer-integrated telephony aims to save users time

An example of a telephony application

While driving, businessperson dials into electronic mailbox using cellular phone

Software agent reads back voice and electronic messages

With phone, user can instruct software to gather information such as sales reports from company databases

Software faxes the reports to the user's hotel

Throwing users an Mbone

Video service allows conferencing across the Internet

By Ellis Booker

Real-time videoconferencing is happening today across the Internet using a kind of network topology overlay called Mbone, or multicast backbone.

This kind of video service may well become a very hot item. According to a survey earlier this year of how information systems executives would use the Internet, videoconferencing was near the top of the list. Cited by 75.9% of the respondents, it was a close second to LAN interconnections, which had 77.3%, according to International Data Corp. in Framingham, Mass.

To make an Mbone network work, a public-domain, multicast routing protocol called Distant Vector Multicast Routing Protocol (DVMRP) is already available. Vendors, including Silicon Graphics, Inc. and Sun Microsystems, Inc., offer commercialized versions of DVMRP and also have included tools for audio and distributed "whiteboards."

More than you think

Mbone traffic is already much more prevalent than one might expect.

"The number of participating networks with Mbone traffic is now the size of 1990 Internet, or around 1,400 networks," said Allison Mankin, a Washington consultant for Kaman Sciences Corp. in Colorado Springs and area director of transport services for the Internet Engineering Task Force (IETF).

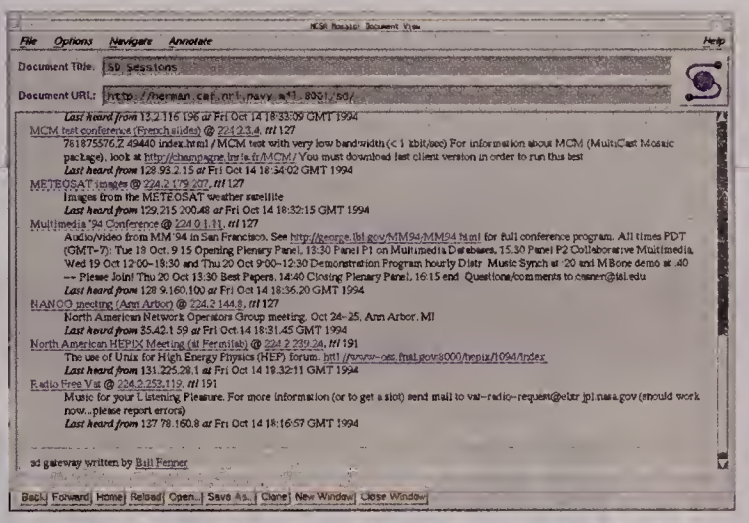
While this is a promising sign, observers admit that Mbone, for now, is generally used for experimentation in academic and laboratory settings.

"I can't think of any production quality use of the Mbone," said Dino Farinacci, a software engineer specializing in IP multicast at Cisco Systems, Inc. in San Jose, Calif.

On the other hand, Mbone could have a broad audience because it works over high-speed dedicated links — T1 and 56K bit/sec. lines — all the way down to a workstation attached to a

Mbone, *page 68*

How it works



The video-ready portion of the Internet, called the Mbone, differs from a traditional broadcast network in which each message packet is replicated to each destination. Instead, the Mbone overlay network uses multicast messaging. This means a single copy of the packet is sent out and only replicated when it hits a designated branch point. This logical topology optimizes the routing path of these video and audio packets, helping to avoid distracting delays.

The Mbone consists of islands that can directly support IP multicast – including multicast LANs such as Ethernet – with Unix machines at the end points.

Workstations are linked through the Internet via virtual point-to-point links called tunnels. The IP multicast packets are encapsulated for transmission through these tunnels, so they look like ordinary packets to intervening routers and subnets.

This free booklet helps you make the right connections.

Linking remote UNIX systems to IBM hosts can be a challenge. There are many issues to consider:

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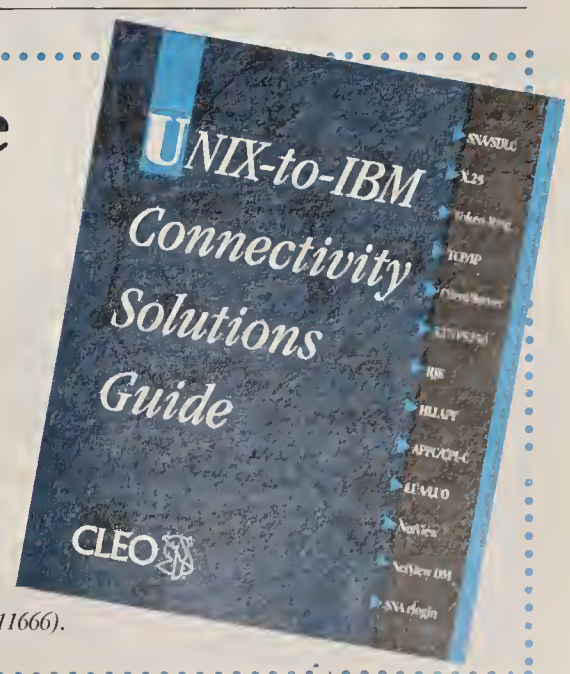

Citizens swamp Utah bulletin board

By Mitch Betts

Build a low-hassle channel for citizens to reach government officials — for complaints, kudos or information — and they will come. That has been the experience in Utah, where the state government's computer bulletin board has been swamped with calls.

The bulletin board system (BBS) had 1,000 calls in its first day of operation in May and has received an average of 300 calls per day since then. As a result, the state's telephone bill for the toll-free 800 number has been surprisingly high.

Utah Gov. Michael Leavitt: *"... it's much easier for the public to voice their concerns"*

"What we've introduced is a way to give citizens faster access to current information about the state, and it's much easier for the public to voice their concerns," explained Utah Gov. Michael O. Leavitt in a statement.

In addition to dashing off electronic mail to the governor and state regulators, the BBS allows citizens to access information posted by various state agencies, including state job openings, consumer tips, press releases, air-quality reports, speeches, regulations and the state budget.

In the first few days, the governor answered some of the E-mail himself, but now the task is usually performed by the same two staffers who handle paper correspondence. Some E-mail goes to the governor or his staff, while certain messages are routed to the appropriate agencies.

One BBS for all

Many state and local agencies across the country have set up public bulletin boards, but Utah has taken a different approach by creating a single, centralized BBS for all its agencies, said Steve Klingler, general manager at BBS vendor Clark Development Co. in Murray, Utah.

Clark Development's PCBoard BBS software is the heart of the system — Utah bought a 50-node license for $750 — and provides a built-in gateway to the Internet. Consequently, BBS users can send and receive Internet E-mail at no cost.

That is controversial, however, because it could be viewed as unfair competition with for-profit Internet access providers. Therefore, Utah may decide to limit the scope of its Internet traffic to government destinations only, said Tina West, system operator for the BBS.

So far, the only public complaints have come from power users who would like a fancy graphical user interface, West said. However, that would require citizens to have some client software and newer, costlier PCs, she noted.

The Utah Public Access BBS is actually just one tier of the state's information infrastructure. The second tier is UtahNet, a wide-area network for state agencies that uses frame-relay technology from US West, Inc. [CW, June 20].

The BBS supports direct log-in from the WAN so state employees can get on the BBS without using a modem. Furthermore, there is a gateway between the BBS and state employees' usual E-mail system, so every four minutes BBS mail is sent to government workers' mailboxes.

An end to paper

The futuristic third tier, called Smart Utah, will let businesses conduct electronic commerce, access state databases and handle regulatory affairs over a state information highway, said LaVarr Webb, the governor's deputy for policy.

"For some businesses, the only reason they have a typewriter at all is to type government forms. We'd like to do away with that so they can do those transactions with electronic forms and save millions of dollars," Webb explained.

UTAH

THE STATE OF UTAH did not want anyone to be left out, so the BBS ensures that virtually any home PC can access the system, including Amiga, Macintosh, Atari and Texas Instruments.

THIRTEEN UTAH AGENCIES are running active conferences on the BBS, including the Utah State Office of Education, Utah State Tax Commission and Utah State Employment Security Commission.

THE BBS IS LINKED to the statewide UtahNet backbone – one of the largest frame-relay networks in the world, with more than 2,000 file servers and 10,000 workstations.

Now the #1 desktop TCP/IP gets you on the Internet free.

Cabletron products target host, LAN linkup

By Stephen P. Klett Jr.

Navigating the road from mainframe-centric networks to distributed, client/server-based LANs can be a bumpy experience for network managers faced with tight budgets.

But according to analysts, the ride should smooth considerably as internetworking vendors continue to deliver cost-effective products that bridge what were once two very separate worlds.

Cabletron Systems, Inc. in Rochester, N.H., recently rolled out a suite of products for its Multimedia Access Center (MMAC) hubs aimed at blanketing every aspect of SNA and LAN integration and management. The products were developed via partnerships with IBM, Sync Research, Inc. and Bus-Tech, Inc.

Spearheading Cabletron's rollout is the LAN Control Access Module, which lets users directly attach LANs to mainframes without an external IBM 3172 controller [CW, Oct. 17]. Also included were modules that connect MMAC hubs directly to 3270 terminals; conversion modules for connecting SNA-based networks with Token Ring and Ethernet LANs; and an update to BlueVision, software that manages SNA and LAN networks from a central platform.

In most cases, each module is designed to emulate the functionality of traditional external IBM controllers or front-end devices. By integrating these devices into a hub, users migrating from SNA to LAN environments can save on equipment and maintenance costs as well as conserve valuable floor space.

Combining the old with the new

"Customers are looking for products that provide a migration path that allows them to keep their existing equipment and allow new advanced technologies to be incorporated into the network," which Cabletron is providing, said Glenn Gabriel Ben-Yosef, a senior analyst at The Yankee Group in Boston.

One such user is the Saskatoon District Health Board in Saskatchewan, Canada, which is looking for ways to leverage its investment in SNA technology while expanding the reach of its Ethernet network. Out of its roughly 2,000 end users, 400 use SNA today.

"We're going to have a mixed environment for the foreseeable future, and we need to make sure our infrastructure can handle that mix for as long as we can," said Guy Paterson, director of systems and telecommunications for the district. The new products "represent a quick and simple solution for us," he said.

The district is testing Cabletron's four-port SNA Network Access Controller Module for Ethernet (SNACMIM-E), which lets it connect SNA controllers in its remote offices to its Ethernet LANs.

SNACMIM-E will replace four 56K-bit/sec. leased line connections, which Paterson estimated will save at least $15,000 in line charges each year.

For other customers, the main boon of a hub-based migration approach is floor space conservation. "It's amazing to see this box that's been your friend for years, that's the size of an under-the-counter fridge, be replaced by a baby card the size of a Webster's dictionary," said a technical support manager at a large motion picture company, who asked to not be identified. "The sizes are coming down while the functionality and reliability are going up."

PRODUCT PREVIEW

CABLETRON'S SNA ROLLOUT INCLUDES THE FOLLOWING:

Product	LCAM	3174MIM	SNACMIM-SX	SNACMIM-E
Definition	First hub module to provide direct channel attachment to IBM or compatible mainframe	Allows 3270 terminals to be directly connected to a hub	Provides a consolidated wide-area link for SNA devices via frame relay	Conversion module that allows SNA SDLC devices to connect to an Ethernet LAN
Designed to	Eliminate need for external communications processors	Eliminate need for external cluster controllers	Eliminate costly leased-line networks	Preserve investment in existing SNA controllers and terminal devices
Price	$18,995, bus and tag	$11,340	$5,195, starting price	$3,740, starting price

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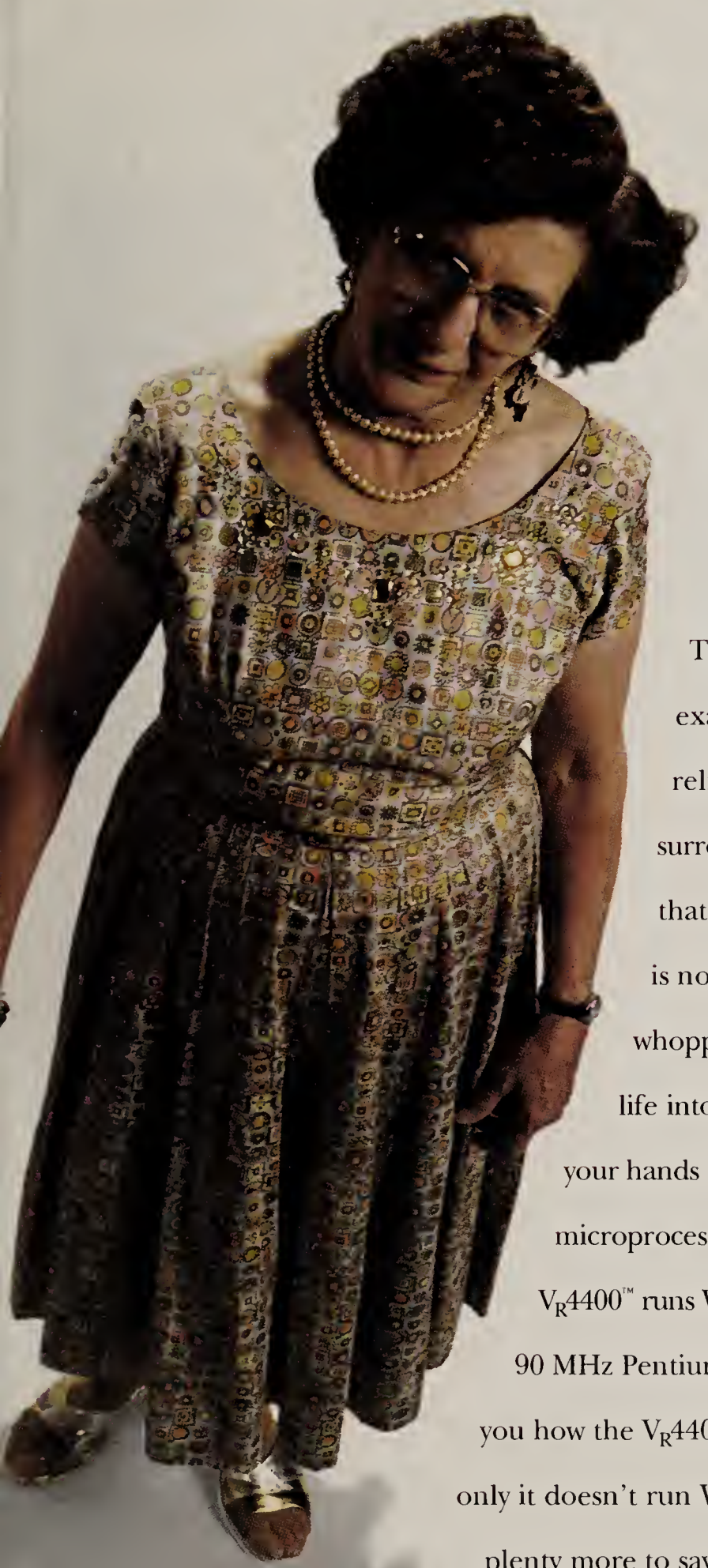

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mation superhighway

Politics on the Internet puts Socks, elections center stage

A semiregular column with items of interest and amusement from the Internet.

Political junkies on the Internet will have a field day during this week's elections. A good dozen servers have been set up around the country by public and private entities to provide everything from candidate biographies and voting records to district maps. California is arguably the hot spot for this activity. The Secretary of State's Office there recently opened a World-Wide Web server that will offer up to 5,000 users simultaneous access to all data, plus poll results updated every five minutes.

*****

Speaking of politics: The new White House Web home page is apparently so hot — you can even hear a digital Socks meow — that it has become "too popular and is melting down," one frustrated would-be user said. It seems you are likely to see "Error 404" when trying to get in. Try the White House home page at http://www.whitehouse.gov.

*****

How to sell something that another gives away? This question confronts the several commercial licensees of Mosaic, the graphical Internet browser developed by the National Center for Supercomputer Applications at the University of Illinois at Champaign-Urbana. Last month, one of those licensees, Mosaic Communications Corp. in Mountain View, Calif., announced a novel strategy. It will give away its own browser to build market share. The 6-month-old company has made a free copy of its Mosaic Netscape client available for downloading. Commercial users can purchase supported, licensed copies for $99 per user. The software is available via anonymous file transfer protocol from ftp.mcom.com.

*****

Indicative of the effort to find synergies between the Internet and conventional business services is AT&T's 800 Directory on the Internet, announced last month. The service has more than 150,000 listings from AT&T's business and consumer Yellow Page 800 directories. Listings are updated monthly, and future versions of the service will enable advertisers to update messages in their ads to reflect current promotions, sales or new business offerings. Reach AT&T's Web server at http://att.net//dir800.

*****

If new public companies are what you seek, check out Entrepreneurs Online's listing services. Along with this list, the Houston-based company is offering a service whereby companies can list the availability of shares for sale to investors or post buy offers. The fee for Scor-net is $2,000 per year, or $1,250 for six months. The company does not yet have an E-mail address for more information.

*****

One noncomputer firm to add a home page recently is Walt Disney Studios. The server from Mickey's maker has current release information from Bucna Vista (Disney, Touchstone and Hollywood) films including QuickTime movies of *The Lion King*, *Quiz Show* and *A Simple Twist of Fate*. "The graphics are incredible," according to one Internaut. Look for Mickey at http://bvp.wdp.com/bvpm/.

*****

Downloading QuickTime video across the Internet is one step away from live video feeds. Late last month, Scott McNealy, CEO of Sun Microsystems, demonstrated the video potential of the Internet when he faced off against Igor Larionov, the star center of the San Jose Sharks hockey team. Technical support came from Illustra Information Technologies, an Oakland, Calif., multimedia database company. The event was shown worldwide.

*****

But video across the Internet demands a fast line, and this is sparking sales of ISDN gear for individual users. One of the latest is the $395 CyberSpace Internet Card from ISDN tek in San Gregorio, Calif. The ISDN Basic Rate Interface card works with any package supporting Window's WinISDN API.

*****

Please keep us posted with your views, news and questions about items published in this space. Contact us electronically at ellis@cw.com.

—Ellis Booker, Gary H. Anthes and Mitch Betts

Throwing users an Mbone

CONTINUED FROM PAGE 63

128K bit/sec. line created from an Integrated Services Digital Network Basic Rate Interface connection. What is more, Mbone's audio and interactive whiteboard traffic have been shown traveling down the pipe to workstations using 9.6K bit/sec. lines.

No sure thing

Still, even its advocates concede Mbone's picture quality is not as good as existing commercial, point-to-point videoconferencing systems. "Using the Internet for transport is going to be a little unpredictable," Mankin agreed.

But Mankin said the growing support for Mbone among workstation vendors and others is significant.

Take Cisco Systems, which for the past three weeks has been selling a multicast protocol designed to work with Mbone. Called Protocol Independent Multicast (PIM), the protocol was developed with one of the IETF's working groups. PIM is aimed at addressing some of the scalability issues of DVMRP.

"[PIM] allows scalable multicast routing," Farinacci said. He added that Cisco has developed tools for making DVMRP and PIM sessions interoperable.

Growing pains

Meanwhile, a thorny issue is how Mbone traffic will affect the Internet should it begin to swell.

The IETF is discussing ways to authorize, and therefore restrict, Mbone sessions, Mankin said. "The main thing is to have the conferences have some form of recovery of cost for the 'net," she said.

It is not too soon to be worrying about this problem, according to Mankin, who said she expects that as bandwidths rise, both in the Internet backbone and for attached users, the number of Mbone conferences will also shoot up.

Internet-surfing bees

It was only 18 months ago, on May 23, 1993, that the Internet's video potential was demonstrated with the broadcast of *War: Or the Discovery of Television Among the Bees*. The cult sci-fi film was transmitted in black and white with unpredictable audio to a small worldwide audience.

Mbones for sale

Tool kits for working with the Internet's overlay Mbone network exist, but like so many things on the Internet they come in both public domain and commercialized versions. A number of workstation vendors, including Sun Microsystems and Silicon Graphics, sell commercial Mbone suites.

Telephony

CONTINUED FROM PAGE 63

taneously, it is expected to spread from server-based applications such as CNL's to personal applications, according to pundits.

"We're in the infancy stage of what will be big in a couple of years," said Jeffrey Kagan, president of Kagan Telecomm Associates in Atlanta. "Customers are not knocking down doors, but eventually there will be a telecomputer on every desk with merged operations for fax, E-mail, video and phone."

Hurdles for establishing such systems include finding staff experienced in both computers and telecommunications, Murphy said. "Now we have to have someone that understands phone systems and PBXs, and that's not the same person that understands computers," he said.

Nothing to build on

Another problem is incomplete standards. Microsoft Corp. has introduced Telephony Application Programming Interface (TAPI), which allows applications to communicate with telephone systems without being written to a specific vendor's hardware.

Similarly, Novell, Inc. said it will deliver next year an updated developer's kit that links its Telephony Services API (TSAPI) with NetWare directory services for tighter integration of phone books with other networked resources.

"Customers are not knocking down doors, but eventually there will be a telecomputer on every desk with merged operations for fax, E-mail, video and phone."

—Jeffrey Kagan Kagan Telecomm Associates

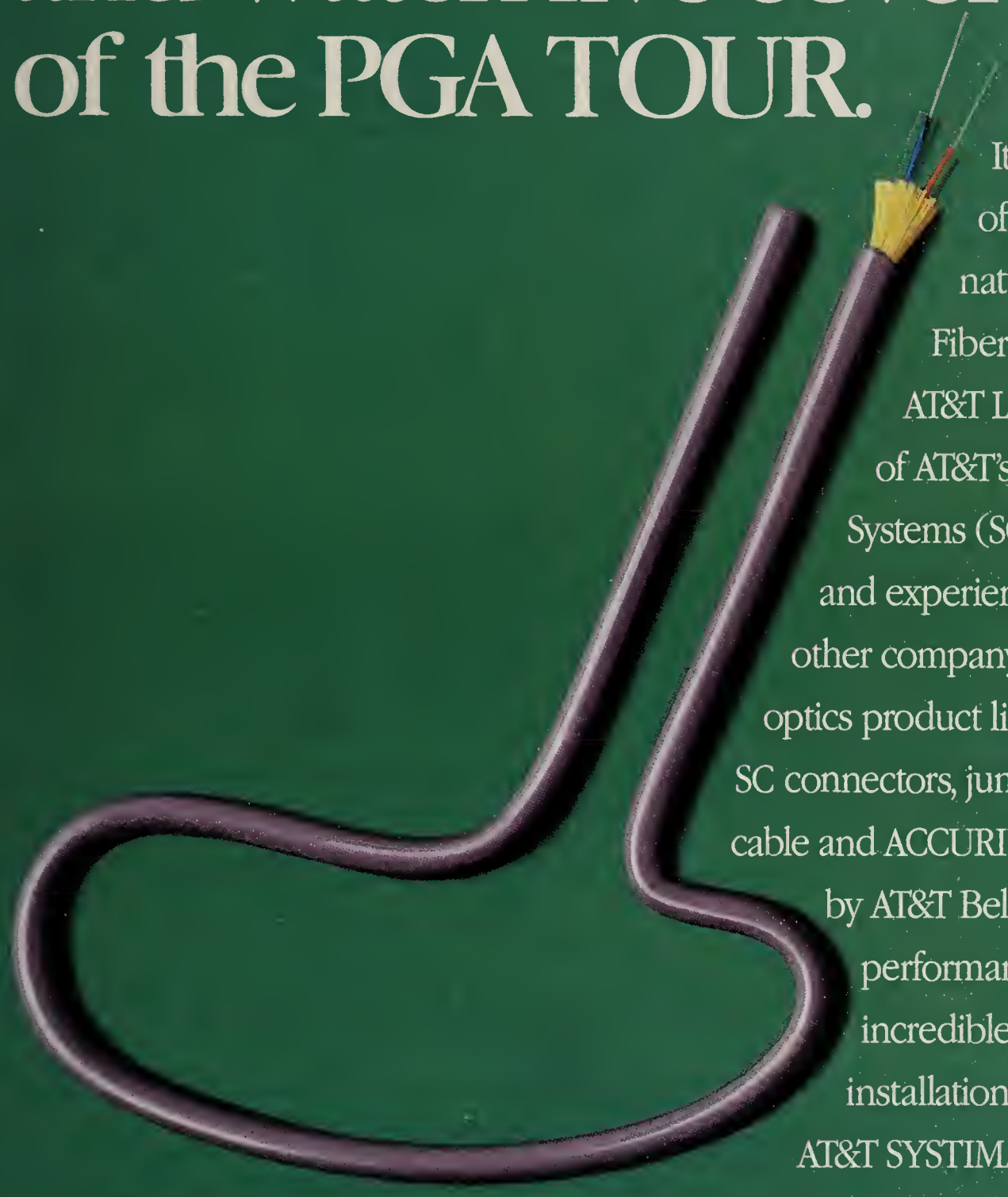
For its part, TAPI is good for the desktop, but Novell's TSAPI is not open enough to cover non-Novell products on the server side, according to Jim Burton, president of C-T Link, Inc., a consulting company in Boston.

Slow delivery

Although progress on the vendor side has been slower than anticipated, key players are beginning to deliver enabling pieces, analysts said. Recent developments include the following:

- Several vendors, including Logical Solutions in Portland, Ore., and Aurora Systems, Inc. in Acton, Mass., recently introduced products that support TAPI.
- Stylus Innovation, Inc. in Cambridge, Mass., said it will ship in December a $495 developer's kit for building TAPI applications with Microsoft's Visual Basic.
- Lotus shipped a bundle that includes Phone Notes, voice cards and Big Sky, Inc.'s telephony server software for $12,000 per server. The bundle helps Notes users access and manipulate electronic messages using Touch-Tone phones.
- Delrina Corp. acquired AudioFile, Inc., a telephony company. Delrina plans to integrate AudioFile's telephony software into its fax and communications products.
- Connectware, Inc. in Richardson, Texas, introduced Cruiser, which is a $199 software product that integrates voice, fax, E-mail and file transfer functions. It also introduced PhoneWorks, a PC telephony adapter that supports TAPI.

Imagine a LAN where you can design a 12-meter racing yacht, videoconference with your boss, and watch live coverage of the PGA TOUR.



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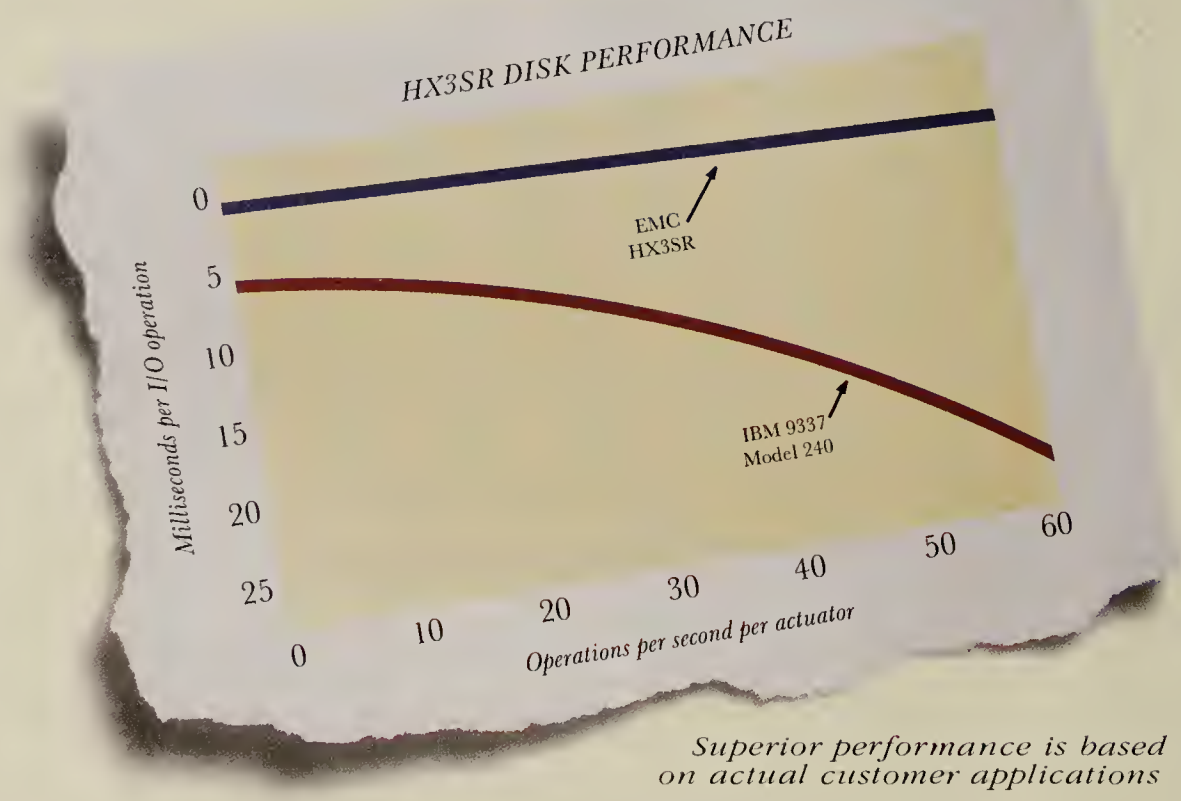

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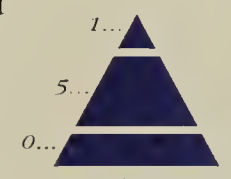

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Thiokol revamps engineering systems

By Thomas Hoffman
OGDEN, UTAH

After NASA's space shuttle Challenger exploded in January 1986, engineers and executives at rocket engine maker Thiokol Corp. did more than go back to the drawing board. They started from ground zero and created electronically connected drawing boards.

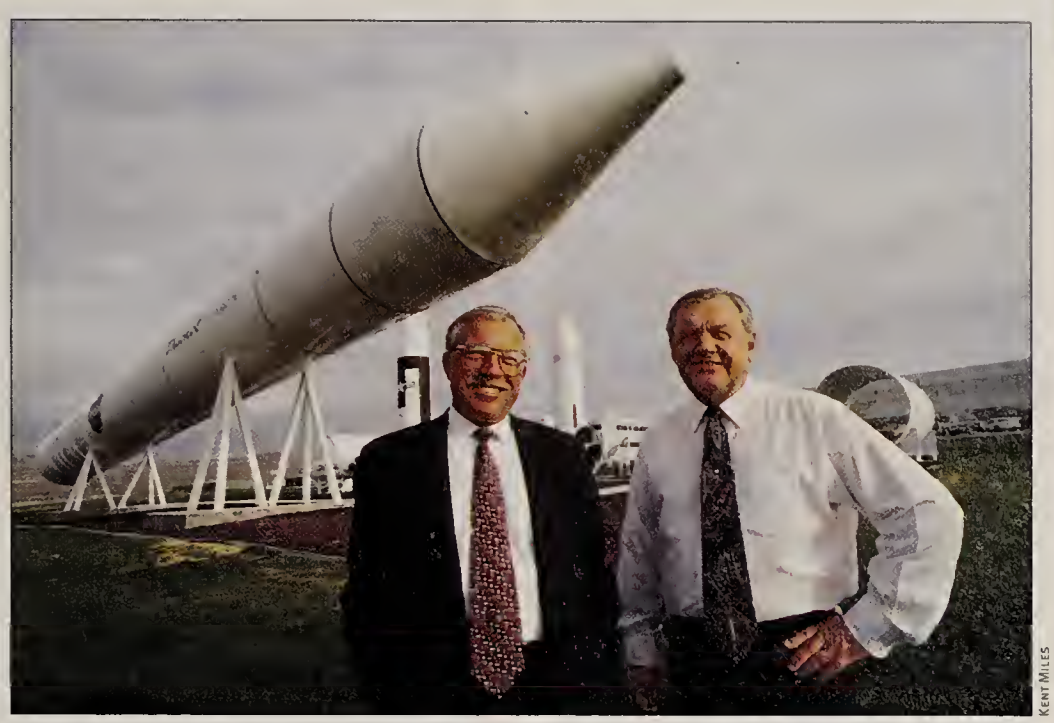
Thiokol, a $1 billion defense and aerospace manufacturer, shouldered most of the blame for the Challenger tragedy because the O-rings it manufactured were found to have lost their elasticity in the unusually cold weather prior to the launch, causing the shuttle's solid rocket booster segments to separate.

Future thought

To ensure quality control in the design, development and manufacture of its next-generation rocket engines, Thiokol is putting the finishing touches on a five-year-long computer systems upgrade that is part of a $70 million project called the Redesigned Shuttle Rocket Motor/Enhancement program, or RSRM/E.

"What we're trying to do is improve the reliability, quality and cost structure of our rocket motors by incorporating an additional layer of regimen but at the same time streamline communications between work areas," said Brad S. Stout, vice president of information systems and chief information officer at Thiokol.

Under RSRM/E, which was primarily funded by NASA, Thiokol has installed a slew of new systems, including a set of clustered Digital Equipment Corp. VAX 6630 shop floor management systems. These are meant to improve the flow of information among design engineers who tackle various aspects of rocket engine design and manufacture. Design instructions, graphics and engineering drawings have all been brought on-line using Sherpa Corp.'s engineering document management system software, which runs on a Digital VAX 7640.


KENT MILES

Thiokol's Brad S. Stout and Mike Evans: *Design instructions, graphics and engineering drawings have been brought on-line for next-generation shuttle rocket engines*

After an extensive review of its operations in the late 1980s, Thiokol realized that its paper-intensive workflow processes were hampering productivity and quality control. For example, to obtain approval for design specifications on a rocket motor case, stacks of documents circulated for weeks at a time before supervisors at Thiokol and NASA and regulators from the U.S. Defense Plant Representatives Office would permit the next project phase to begin. With the RSRM/E systems, such signoffs will soon be done electronically within a few hours.

Thiokol's Computer Integrated Enterprise (CIE) project, a key element of the RSRM/E program, includes manufacturing resource planning (MRP) II, shop floor management, configuration management, quality management and executive information systems. Thiokol's VAX-based shop floor management systems are linked to an IBM 3090-600E mainframe, which runs the company's MRP II system as well as its corporate financial applications.

Thiokol uses IBM's COPICS-Enhanced MRP II software to develop its MRP II applications. Engineering data that was once text-based is now graphically generated and

Thiokol, *page 74*

ON SITE

Thiokol Corp.
Ogden, Utah

Challenge: To replace a paper-intensive environment for design and manufacture of solid fuel rocket motors with electronically interconnected systems to streamline processes and improve communication among engineers.

Technology: Digital's VAX minicomputers and workstations; IBM's 3090-600E mainframe; Information Builders, Inc.'s Enterprise Data Access/SQL software; IBM's COPICS-Enhanced MRP II software; Pallette's software; Sherpa's engineering document management software.

Results: Expected to reduce authorization times on equipment specifications and to enable engineers to share and manipulate documents on-line.

Users keep to client/server path but recommend caution

By Rosemary Cafasso

Users have grown sober about client/ server computing, but they have no plans to slow down, according to a recent survey from Sentry Market Research in Westboro, Mass.

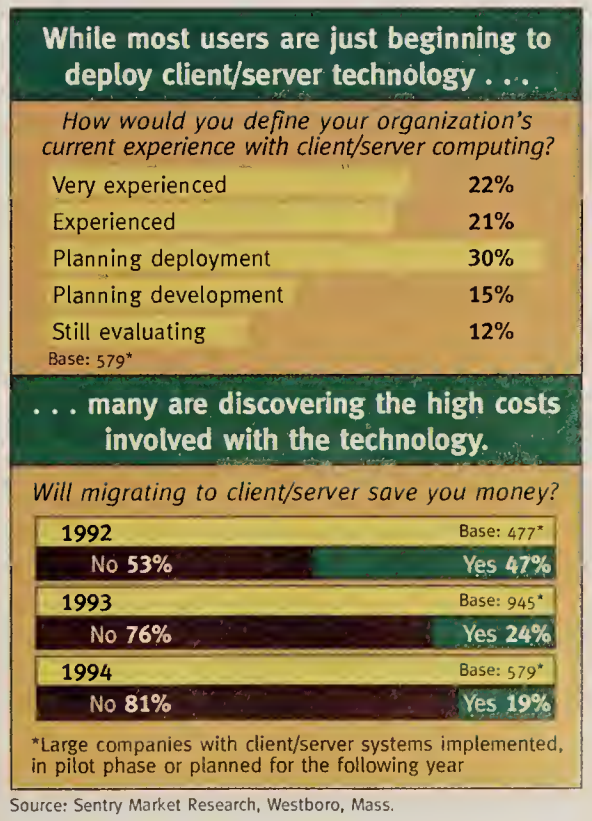
The report, Sentry's fourth annual survey on client/server trends, showed that many users are scaling back their expectations and no longer see client/server as delivering sky-high cost savings and benefits. Nonetheless, Sentry suggested many users feel too much pressure from management and users to back away from the new technology. Sentry received responses from nearly 600 users.

No pain, no gain

What is more, users said in separate interviews that even though client/server migrations can cause pain, they ultimately will deliver benefits that make them worthwhile.

"It's like a football game," said David Brousell, a director at Sentry. "You get knocked down so many times before that first down, but you have to keep going because the clock is ticking. The clock here is business pressures."

Several users contacted last week said they agreed with some of the Sentry findings. Kevin Reilly, vice president of information systems at Richardson Electronics Ltd. in LaFox, Ill., said he agrees that there is virtually no turning back on the road to client/server.



Source: Sentry Market Research, Westboro, Mass.

If there is no evidence of a slowdown, that is because "at this point I don't think anybody can," Reilly said of the Sentry results. "You can't talk to a salesperson without hearing the words client/server," Reilly added.

The typical user site counts on an average of eight different vendors' products for its client/server project.

Other users agreed that the industry pumped up client/server technology to a magic bullet status so it was bound to fall short of those expectations.

"It is a lot more difficult than people thought," said Steven Wells, director of IS at Suburban Propane Co. in Whippany, N.J., which uses the R/3 client/server application suite from SAP America, Inc.

"The time to convert is longer than people think," Wells added. "I don't think that will turn people away because it is the right direction."

Wells said his initial cost savings projections of $2 million to $3 million per year were on the mark because they were based on mainframe service charges that were eliminated. But Wells said he underestimated consulting fees associated with the R/3 implementation because the SAP environment was more complex than he expected.

Users, *page 74*

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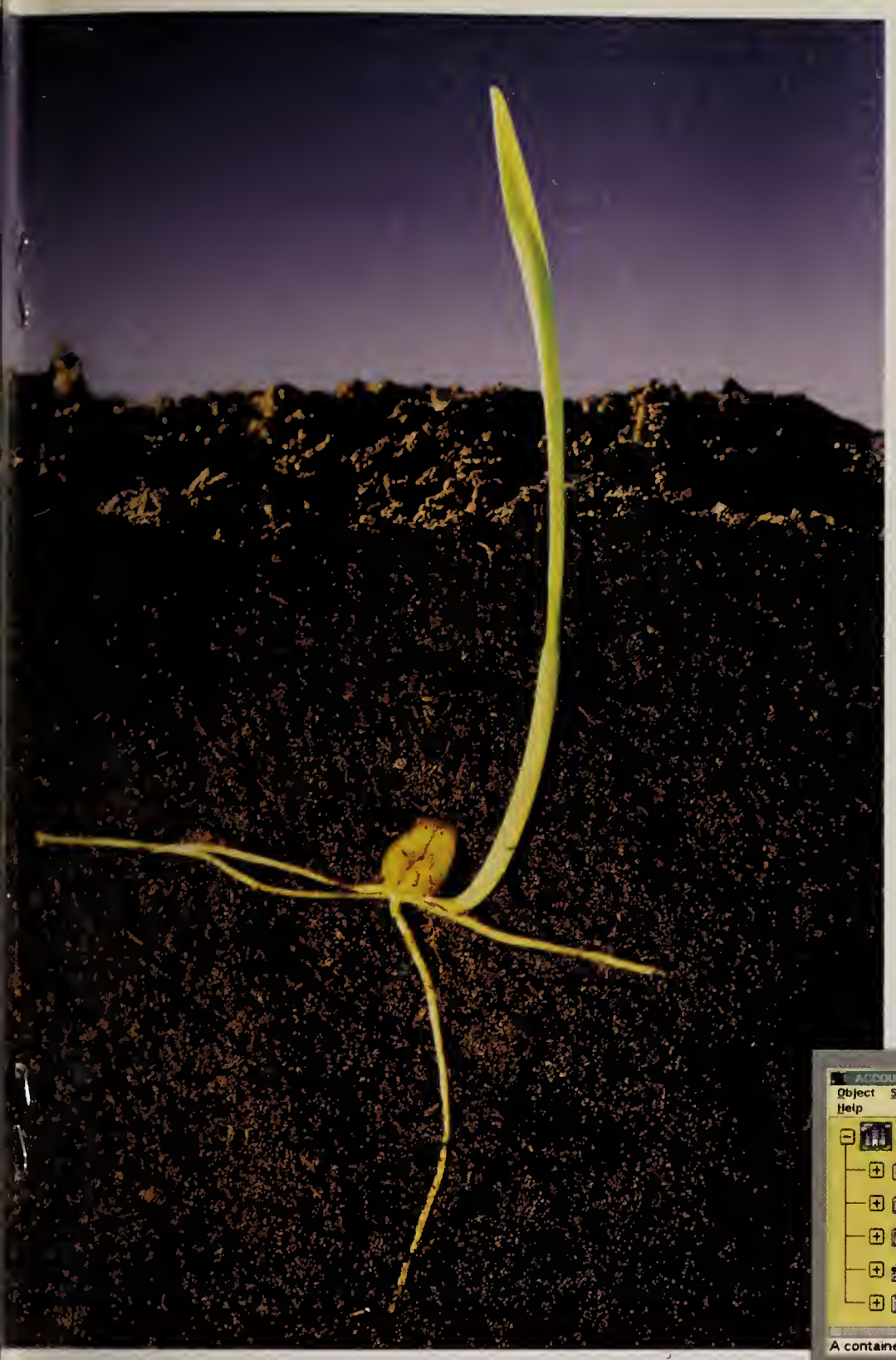

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Bank looks for dividends from conversion

Move to DB2 lays foundation for client/server

By Craig Stedman

How do these sound as selling points for a project? It will take two to three years and cost millions. The functionality of key applications will have to be frozen for three or four months at a stretch. Developers assigned to specific business units will temporarily get pulled back into the information systems orbit.

Welcome to the wonderful world of mainframe database conversion. One of the companies already there is Bank of Montreal, which is in the early stages of converting about 25 applications from Computer Associates International, Inc.'s CA-IDMS hierarchical database to IBM's DB2 relational software.

Key functions such as general ledger, accounts payable, human resources and international banking are included, and getting management to go along with the project "was not an easy sell," acknowledged Rita Nayar, manager of database management services at the bank's Willowdale, Ontario, facility.

Focus on IS

"It's a resource issue more than anything," Nayar said. "We have to get [developers] from every part of the bank, and it's not an easy call to take people away from IDMS and have them work for a time on something where they're having no discernible impact on the business."

However, the anticipated benefits of switching to DB2 were persuasive enough to get a green light for the conversion project. Some of Bank of Montreal's largest applications, including its credit card, treasury and loan programs, are already written to DB2, and managing two different databases no longer made much sense given the age of CA-IDMS, Nayar said.

In fact, CA-IDMS "was becoming a hindrance," Nayar added. The bank was nearing the limits of its CA-IDMS file capacities on some applications and would have had to go through "a complicated methodology and a major effort" to increase the size of the files, she said.

Meanwhile, DB2 should improve data access because of its relational nature and its SQL support, Nayar said. It is also backed by a wider assortment of development tools, and standardizing on the IBM database should make it easier for the bank to gravitate toward client/server technology using the OS/2 and RS/6000 versions of DB2, she added.

Outsourced solution

To try to keep the length, cost and training requirements of the CA-IDMS-to-DB2 project within reason, Bank of Montreal outsourced all the work except for testing the converted code. It chose Forecross Corp., an automated conversion tool vendor in San Francisco that charged about half as much as the closest bid from an offshore manual conversion outfit, according to Nayar. Domestic consulting firms proposing manual conversion wanted as much as five times more than Forecross, she added.

The bank is also counting on automated conversion to be more reliable than the manual method, thus allowing it to speed up the process of converting the 1,500 or so programs that compose the CA-IDMS applications. "This is huge, so we'd better get it right," Nayar said. "A lot of dollars are riding on it."

The project, which started last fall, "has been going pretty well" thus far, Nayar added. Forecross typically is able to convert about 90% of a program automatically, leaving only a small portion to be done manually by the vendor, she said. However, it has been averaging a single program daily rather than the two or three per day that it told the bank would be feasible with the automated tools.

The first phase of the project, in which several CA-IDMS applications written in the ADS/O language are being converted to Cobol, also was slowed down by the complexity of scheduling the required functionality freeze in human resources. "There are so many changes going through at any one time," Nayar noted.

That phase is now in the final stages, though, and the bank still expects a second phase covering most of the DB2 conversion to be completed on schedule by next August, she said. A third phase will follow in which the two largest CA-IDMS applications, international banking and a financial system used for internal reporting, will either be converted as is or rewritten to add new functionality.

Clear as glass

Roy Martin, manager of information access and control at the bank's offices in Toronto, said conversion of its loans quality application from ADS/O to Cobol "was almost transparent to us." The temporary freeze on new functionality did not have any noticeable impact on operations, although Martin noted that loans quality "wasn't getting a lot of functionality added to it anyway."

That application is expected to be fully converted to DB2 early next year. Martin said he has not been told to expect any great increases in data access time, but recovery from system crashes should be "much faster once we get to DB2." Under CA-IDMS, loans quality can be "off the air for half a day" after system crashes occur while IS tries to pinpoint the problem, he added.

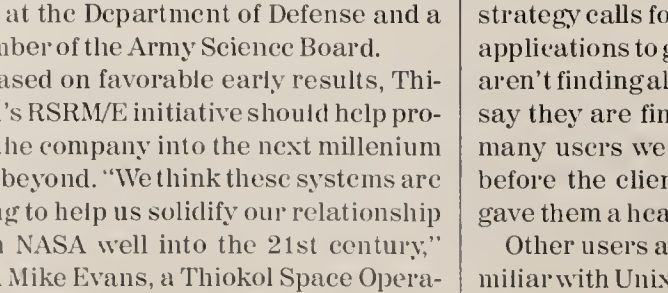
Nayar said elapsed time on queries typically should be reduced by the move to DB2, although it will vary "depending on the application." One new issue that has come up as the conversion proceeds, though, is a higher level of mainframe CPU utilization by DB2 compared with CA-IDMS.

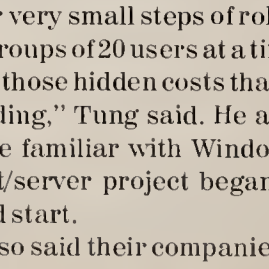
"We always knew DB2 would be a little more," she said. "But from the little experience we have, it's more like two or three to one." While it is too early to determine whether the bank's mainframes will need any upgrading, "we're still going along the right path from the standpoint of a cost/benefit analysis," Nayar added.

Conversion factors

THE BANK'S POINT-OF-SALE APPLICATIONS are in homegrown databases built on VSAM files and will stay there for now, said Rita Nayar, manager of database management services. Those would be more complicated to convert to DB2 than the IDMS applications because of their on-line nature, she said.

The move away from IDMS is expected to cost in "the low millions of dollars" and take up to three years to complete, according to Nayar. Bank of Montreal, which is handling the testing of the converted code internally, has between seven and 10 employees working on the project at any given time, she said.





RITA NAYAR

Thiokol

CONTINUED FROM PAGE 71

transmitted among engineers thanks to the Sherpa software. Thiokol also uses Pallette Systems, Inc.'s Pallette VAX-based software to enable its shop floor staffers to share files and review engineering specifications with one another. To ensure quality control, SAS Institute, Inc.'s SAS System software is used for data reporting.

Thiokol began piloting its shop floor management systems last month. Beginning next year, all new work orders will be done using only the automated systems. The five-year effort remains on schedule and even slightly under budget — a rather Herculean effort in an industry that has been historically associated with largesse.

Like other defense and aerospace survivors, Thiokol has learned to do more with less. Cuts in defense spending have pared its revenue by 30% in the past three years, forcing a 40% reduction in its IS spending in the same period.

In light of these fiscal constraints, Thiokol has sharpened its efficiency under initiatives such as RSRM/E to keep its profits on an even keel.

"Defense manufacturers have to be smart these days to survive. The plush days of defense are over," said Paul Strassmann, former director of information at the Department of Defense and a member of the Army Science Board.

Based on favorable early results, Thiokol's RSRM/E initiative should help propel the company into the next millenium and beyond. "We think these systems are going to help us solidify our relationship with NASA well into the 21st century," said Mike Evans, a Thiokol Space Operations executive and director of the CIE project.

Users

CONTINUED FROM PAGE 71

Some users said common sense is the key to avoiding disappointments: Users should do a better job at managing expectations and the client/server project itself.

Terry Tung, a senior manager in IS at Morrison Knudson Corp. in Cleveland, said his firm has had no serious problems with its client/server migration because its implementation strategy calls for very small steps of rolling out applications to groups of 20 users at a time. "We aren't finding all those hidden costs that people say they are finding," Tung said. He also said many users were familiar with Windows long before the client/server project began, which gave them a head start.

Other users also said their companies got familiar with Unix, Windows and PC networks before rolling out client/server software to more slowly bring change to the organization.

New Product

I.D.E. Corp. (IDEA) has enhanced its PreView IBM AS/400 query and reporting tool with two new offerings: PreView Plus and PreView Gold.

According to the Billerica, Mass., firm, the products target AS/400 users with different databases. PreView Plus adds graphing, charting and runtime forms features. PreView Gold lets users create custom forms, design database templates and stylize a graphical user interface. PreView is an integrated feature of IDEA's IDEAcomm Midrange Client 3.1 PC-to-host connectivity software.

Upgrades to PreView Plus cost $149 and $249 for PreView Gold.

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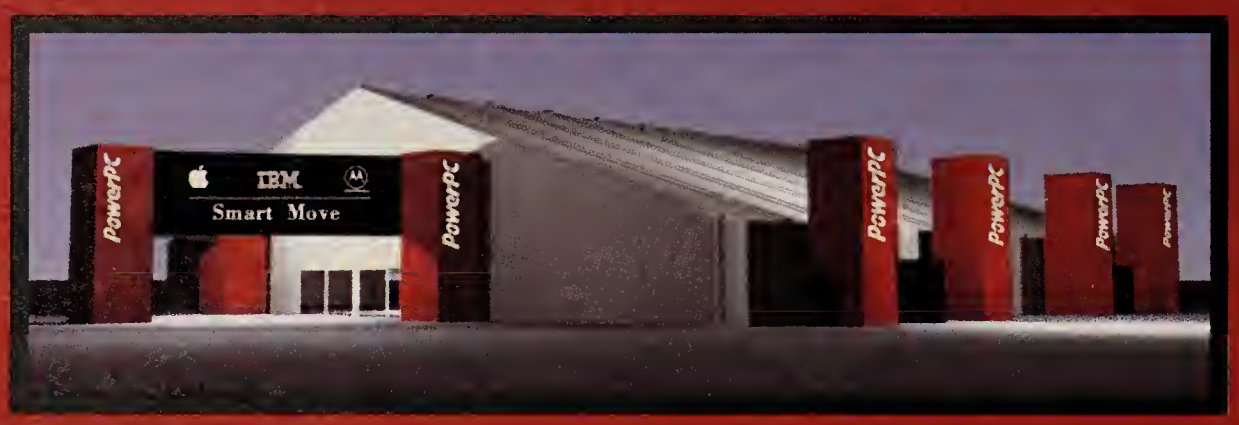

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United's maintenance flies client/server skies

Worldwide mechanics to gain access to on-line manuals

By Jean S. Bozman
SAN FRANCISCO

■ United Airlines is putting its 25-year-old aircraft maintenance information systems in the repair bay for a re-engineering overhaul.

By so doing, the $14.5 billion airline said it is continuing its three-year drive toward client/server systems by rolling out Unix-based servers starting in January. The airline has previously tested its client/server wings at its primary hub center at O'Hare International Airport in Chicago as well as in food-service operations.

United's Wayne Anderson *says IS changes could reduce airplane stays in repair hangars by 10%*

By 1998, the fully deployed Engineering and Maintenance System (EMSys) will run on about 350 Unix servers and 10,000 client machines. The clients, including IBM-compatible PCs, Macintoshes and Unix workstations, will be used by mechanics from San Francisco to Tokyo to London to access on-line databases of technical information.

United plans to save $175 million to $200 million over five years and to reduce airplane stays in repair hangars by 10%, said Wayne Anderson, director of MIS systems at United's maintenance division here. United estimates it will save enough to buy five jets, while expanding its overall fleet from 550 jets to 600 by 1998.

First, an on-line database called the Technical Information Management System (TIMS) will put paper-based repair data on-line, using federal Computer-aided Acquisition and Logistics Support standards to exchange data with airplane manufacturers. In 1996, after the Material Management System for warehousing engine parts and a new Planning & Control scheduling system ship, some mainframe applications will be taken off-line at United's Chicago headquarters.

Mainframe inspired

To write all the EMSys applications, United and IBM's Integrated Systems Solutions Corp. (ISSC) consulting unit fielded a team of more than 200 developers. The revamp of maintenance systems is part of an IS effort that will change business processes as it replaces mainframe applications.

The arrival of the new Boeing 777 jet was a strong reason for replacing outdated paper-based maintenance systems, said Joe Mihalik, business development manager at ISSC in Boulder, Colo. Mechanics will soon be able to log on to many different Unix servers to access more than 80,000 pages of technical manuals on Boeing 777 parts.

Distributed databases are expected to prevent system downtime as they bring TIMS' on-line technical manuals closer to end users. Replicated Sybase, Inc. System 10 databases will prevent work outages if one or more of the distributed Unix servers fail, Anderson said.

Although United did not disclose the full cost of the system, EMSys architecture creator Qadrant International PLC in Sydney, Australia, said a complete EMSys would cost from $10 million to more than $50 million, depending on airline size. Qadrant is affiliated with the Australian airline Qantas Airways Ltd.

Stephan Regulinski, vice president of base maintenance for United's worldwide maintenance operations, said United had budgeted less than $100 million for the EMSys project because it is developing much of the EMSys application code in-house.

Substantial benefit

Airline industry experts said United's up-front investment will be well worth the cost, particularly if it creates more efficient operations. "They're in it for the long run," said Alan R. Youngberg, national director at Ernst & Young's aviation consulting practice in Washington. "They're willing to expend capital to improve their competitiveness."

By running a more efficient repair shop on five continents, United plans to save both time and money. "The fundamental change in the business process is that about 60% of the work we do is non-routine," said John Curphey, manager of project development engineering at United's operations division here. "We want to reduce that nonroutine work from over 50% to under 20%."

Cost reduction is one main aim of re-engineering, but analysts said the trend has barely taken hold in the airline industry. Although many airlines have seen cutbacks tied to work force reductions, United is expected to retain its work force — from which it won important labor concessions in an employee buyout this year. United recently expanded its routes, and analysts expect the airline to show a profit this year.

"I think a number of [airlines] are just getting started" with re-engineering, said Nicholas Radell, a vice president at Mercer Management Consulting who runs the firm's aviation consulting practice in Chicago. "They're all aimed at productivity, but if you're going to restructure, hopefully you're going to work smarter rather than just harder."

On schedule

United's EMSys will include Hewlett-Packard Co. HP 9000 T500 Unix servers, replicated Sybase relational databases and up to 10,000 client PC and Unix workstation systems. It will replace applications running on Unisys Corp. 1100 and 2200 mainframes and on several mainframes from IBM and Hitachi Data Systems Corp.

Project management helps airline stick to schedule

By Tim Ouellette

United Airlines has learned that one price of becoming a global airline is an increased dependency on information systems to help manage far-flung resources and projects.

To maintain the airline's 549 aircraft, which make 2,000 flights per day, United needed project management software that corresponded with the company's commitment to client/server. Richard Gleason, MIS project office manager at United, turned to Project Workbench 2.0, a PC-based software package from Advanced Business Technology Corp. in New York.

"There was not really anyone else in the running," Gleason said. "From a price/performance standpoint, others were not as flexible, fast or easy to use."

United had been using Project Workbench 1.0 since 1985 on a limited basis to replace hand-drawn Gantt charts. The airline is using the upgrade to integrate more than 80 mainframe applications; tie together areas such as architecture development and technical support under one operational due date; and help develop, implement and manage United's worldwide fleet maintenance program.

Project Workbench 2.0 lets users define and link dependencies among unlimited projects in a group and automatically calculates optimum schedules. This is important because managers "need to understand the impact of one project across the whole and compare it to the back-end due date," said Steve Babcock, an associate at Schubert Associates, Inc., a management consulting firm in Boston.

Easy does it

The flexibility provided by the product makes these relationships easier to see. "You can go in and really use all the data available and design any views that you need," said Gleason, who is responsible for the overall project management process. Different views of the same data can be customized for the different levels of information required, from an individual project manager's overview to a to-do list at a programmer's desktop.

Project Workbench 2.0 is being installed at company project sites around the world. Gleason said the Windows interface in Version 2.0 has removed any training problems that usually would be encountered.

Lynda Bodman, chief executive officer at Schubert Associates, noted that Project Workbench is optimized for IS projects. Although the product, which costs $1,275, is more expensive than other project management software, she said users save time because they do not have to adjust schedules to accommodate changes in dependent projects.

Briefs

Disaster recovery array

EMC Corp. has introduced software that will let users of its Symmetrix 5000 mainframe disk arrays duplicate data on remote subsystems for disaster recovery purposes. Earlier this year, IBM began offering a similar capability for its mainframe disk products. EMC will initially support distances of up to 60 km via Escon-compliant cabling, but longer wide-area network links should be possible next year, according to the company. Its Symmetrix Remote Data Facility costs $125,000 per disk array.

On to Oracle

ViewStar Corp. in Alameda, Calif., plans to port its document management, indexing and workflow tools to Oracle Corp.'s database by early next year. The tools now support Gupta Corp., Sybase, Inc. and IBM DB2 databases.

Unisys hires Carns

Stephen A. Carns, 48, has been named president of **Unisys Corp.**'s Information Services and Systems Group, which is responsible for approximately $5 billion of the company's $7 billion-plus in annual revenue. Carns, who is a 15-year sales and marketing veteran at IBM, was most recently president and chief operating officer at Systematics Information Services, Inc., a Little Rock, Ark., facilities management vendor for the financial, telecommunications and health care industries.

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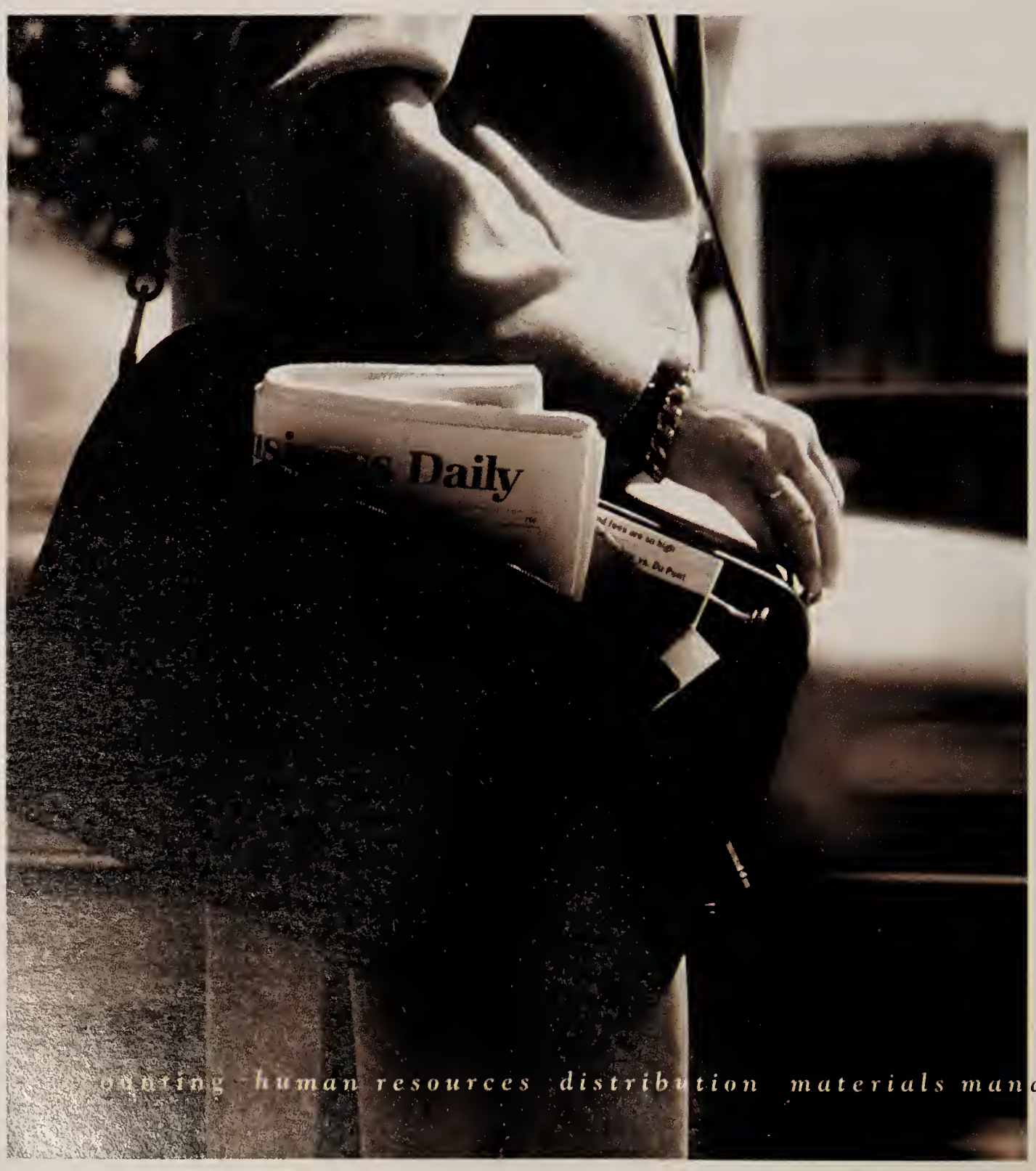

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Commentary

Mitch Betts

'net lessons

If managers could eavesdrop on their programmers talking shop around the watercooler, they might hear something like this:

Things programmers hate:

- Compiler bugs.
- Operating systems without protected memory.
- Other people's poor-quality (or undocumented) code.
- Other people's poor-quality code being sold for big money.
- Spending days to optimize your code, only to discover it has slowed down.
- Recurrence of a bug that you thought you'd fixed a week ago.
- Time-wasting "status meetings," which are usually an embarrassment anyway.

Where to look

That's the list I compiled by doing a little eavesdropping on the Internet, where programmers around the world share their tips, tricks, hopes, fears and gripes. As I "lurked" among the Usenet news groups — particularly comp.programming, comp.software-engineering and comp.client-server — it occurred to me that IS managers could learn about the concerns of today's programmers if they, too, did some Internet lurking.

(Caution: Because 98% of all Usenet postings are garbage, the mission is to find the gems. Look for a "thread," or a series of messages on one topic, that has an interesting subject heading and at least four responses.)

I know the Usenet traffic is not a statistically valid sample, but it is still troubling that many of these postings have an undercurrent of discontent — of feeling underappreciated by management. One user observed that management is beginning to view programmers as a mere commodity, easily jettisoned and easily replaced. Older programmers, meanwhile, try to keep their skills up to date and worry about age discrimination.

Recently, one of the more active threads dealt with this seemingly mundane question: Does squeezing a programmer into a tiny office cubicle hurt productivity?

The programmer who started the thread had just been moved into a 5- by 10-foot cubicle and was none too happy about it. "Be thankful," another replied. "My current company packs folks in at four per cube area (usually 12 by 12 feet). A pair of people share one workstation and one phone line."

He complained that the sardine approach eliminates privacy and any possibility for "think time" because of incessant noise. "It sucks. Productivity sucks, morale sucks," was the way he put it.

Some respondents suggested buying a Walkman-like radio with headphones to block out the noise. "It's an investment that could save your sanity," said one post, although there is a danger you could look up one day and find that the building has been evacuated because of a bomb scare.

Having to share phones and workstations was widely criticized, but there were some pro-cubicle votes, as long as the cubicles are decent-size and have 6-foot-tall, sound-absorbing panels. One veteran noted that a posh office and a big mahogany desk can actually have a chilling effect on casual team meetings.

The ideal, another respondent said, may be to have personal cubicles for heads-down work and a big common area that supports team work.

People issues

In any case, the general thrust was that management needs to give a lot more consideration to "peopleware," including the quality of a programmer's work environment. Office design, furniture and lighting all matter. Several coders said good advice on the topic can be found in the 1987 book *Peopleware* by Tom DeMarco and Timothy Lister, but it continues to be ignored by management.

All of this reminds me of a prediction I read not long ago. Some futurist proclaimed that programmers will be the next target for unionization if programming becomes a "sweatshop" occupation.

The notion seemed far-fetched. But the complaints I've seen have made me think there will be hell to pay if management continues to ignore the peopleware issues.

Betts is a *Computerworld* senior editor in Washington. His Internet address is mbetts@cw.com.

Distributed computing

OMG vote stalls DCE progress as standard

By Jean S. Bozman

Users of the Open Software Foundation's (OSF) Distributed Computing Environment are worried that DCE will become an option, rather than a necessity, for distributed object computing.

The DCE cause was set back by the Object Management Group's (OMG) vote last month to bypass DCE's remote procedure calls as the basis for the OMG's Common Object Request Broker Architecture (CORBA) 2.0 [CW, Oct. 24].

Votes by the OMG's technical committee and board of directors still lie ahead. But if the OMG finalizes the current CORBA 2.0 proposal, DCE advocates said an opportunity will have passed by.

"I think we missed out on having DCE be one of the required implementations of objects," said Ted Hanss, chairman of the OSF's end-user steering committee. "Now it will be an optional one if it proceeds this way." He said the OSF is working directly with systems vendors "to make sure they will ship the DCE conformance."

DCE already has built-in network navigation, security and file-directory features — all useful in distributed object networks, DCE users said.

DCE/CORBA merger

The CORBA 2.0 task force voted to adopt a low-level networking protocol approach — and to make DCE an extension of the basic CORBA 2.0 standard. Backers of this "merged" Universal Networked Objects proposal argued that a lightweight TCP/IP "wire" protocol would require less system memory than DCE's remote procedure calls.

Low overhead will be key to system performance because each device on a distributed network must hold a slice of the CORBA 2.0 code, the proponents said.

Meanwhile, users at large sites are hoping some clear standards will soon emerge — even though extensive object networks are not expected to become commonplace until 1997 or later.

"We're tracking all the standards," said Jerry Johnson, senior policy analyst for the state of Texas in Austin, whose technology group advises more than 200 state agencies. "It's kind of like filling in a pyramid," he said of the recent OMG vote. "Everyone's working on the individual pieces, but now as the technology merges, it's all coming to a head."

Longtime DCE advocates at vendor and user sites said they feel DCE technology is proven for interoperability among dissimilar computers. And some are still hoping that the OMG will either reverse or modify its decision in upcoming votes on the CORBA 2.0 proposal. Even so, they concede that DCE's roots are in procedural, not object, code.

Object ORIENTED

Future links

In January, Microsoft will provide specifications to allow the Object Management Group's CORBA model to interoperate with the Common Object Model. COM, a variant of Microsoft's Component Object Model, will be ported to Unix platforms to create links to Microsoft's OLE applications.

Light and easy

Some who opposed the DCE proposal for CORBA 2.0 have argued that its code was too complex to make it ubiquitous in large global networks. But Joe Maloney, the OSF's DCE business area director, countered that DCE has already taken the first steps toward object orientation. He said the OSF is publishing the "lightweight" DCE remote procedure calls proposed for use in CORBA.

"I would say things aren't closed yet," said Hanss, who directs the Center for Information Technology Integration at the University of Michigan at Ann Arbor. But two more OMG votes are needed for approval, he said. "It's a much broader group of people," Hanss said. "People will clarify their positions some more to find how much of this agreement is technical barriers vs. packaging barriers."

Either way

Microsoft Corp. has its own plans to link its Common Object Model (COM) object architecture and CORBA 2.0. "We're going to work on CORBA interoperability, regardless of the outcome," said Mark Ryland, senior program director for Microsoft's Object Linking and Embedding products.

"We just think our work would have been easier if the DCE wire protocol had been adopted," Ryland said. Microsoft will work with systems vendors to port COM directly to a variety of Unix servers — without the use of CORBA 2.0 at all, he added.

Some users who are counting on DCE to solve corporate security issues said they are unhappy with the first OMG vote. "It meant CORBA became less relevant," said Bill Estrem, a project leader in 3M Co.'s information architecture department in St. Paul, Minn.

"Right now, it's a technology that hasn't been developed and that doesn't have a spec, whereas DCE is being adopted by large enterprises," he said.

However, according to industry analysts, there are far more DCE pilot projects at user sites than there are full-blown DCE production applications.

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IBM's VisualGen tool puts focus on team collaboration

By Ed Scannell

IBM has announced a series of client/server development tools that allow programmers to collaboratively develop mission-critical applications.

VisualGen Team Suite, which is workstation-based, offers corporate developers an object-oriented, visual programming environment in which they can refurbish legacy applications and build new ones more quickly by visually connecting component parts. The tools also let developers use and reuse code across platforms.

Multitasking users

"We are focusing on the tight integration of data and the ability to leverage corporate customers' assets. They can put together line-of-business applications faster by being able to work on different parts of an application simultaneously," said Ralph Rodriguez, market manager at IBM's Rapid Application Development group in Carey, N.C.

VisualGen Team Suite "allows us to use our iterative prototyping approach, where we work with our users to continually refine applications during the development process," said Ronald McEvoy, senior vice president and chief information officer at Fred Myer, Inc. in Portland, Ore. "Developers can take advantage of cooperative processing where we expect a 2:1 productivity improvement," he added.

A key feature of the suite is a requirements definition tool that lets application designers document and otherwise organize data in a LAN-based repository. The tool has a built-in database designer that lets programmers customize database designs that best fit users' individual environments.

Environmentally friendly

All applications created using VisualGen Team Suite are inherently optimized for use with database, transaction processing and several message queuing environments, IBM said. For instance, such applications work with several environments, including IBM's DB2, CICS, IMS and Message Queuing series.

The new release of VisualGen is expected to be available next month. Beta testing for VisualGen Team Suite, DataAtlas for OS/2 and TeamConnection for OS/2 is scheduled to take place before year's end. Pricing on these products will be determined at the time of release, an IBM spokesman said.

It's in there

Included in IBM's new VisualGen Team Suite are the following:

- TeamConnection for OS/2, a repository-like facility that manages and stores application components that can be shared in a central location.
- IBM DataAtlas for OS/2, a data dictionary that provides a centralized source for creating and maintaining data definitions.
- A new version of VisualGen's applications builder that runs on a variety of operating systems, including OS/2, AIX and, eventually, OS/400.

New Products

Lenel Systems International, Inc. has announced Lenel Gallery, a graphical user interface tool for Windows application developers.

According to the Fairport, N.Y., company, Lenel Gallery lets users integrate graphical thumbnail galleries, menus and tool bars directly into their applications.

The product features Microsoft Corp.'s Object Linking and Embedding, drag-and-drop, shadings, color and border settings and thumbnail sizing options.

Lenel Gallery costs $299.

▶ *Lenel Systems International (716) 248-9720*

PencilRock Products has announced King Arthur, an icon-based authoring tool for multimedia applications.

According to the Montreal company, King Arthur replaces scripting with mouse-operated functions found in on-screen menus and palettes.

Users can inspect a current project map at any time and set preferences and defaults. The product runs with SuperCard multimedia authoring software.

King Arthur costs $64.

▶ *PencilRock Products (514) 866-4429*

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Unify aims at high-end client/server market

Vision targets need for high power and usability

By Melinda-Carol Ballou

Unify Corp. last week announced a new version of Vision and joined the throng of software tools vendors targeting high-end, transaction-intensive client/server development.

Observers said Unify's differentiator is its ability to create scalable client/server applications easily. While a number of products are emerging on the tools scene that allow developers to create transaction-intensive, higher-end client/server applications (from vendors such as Dynasty Technologies, Inc.), these tools are difficult to learn and use, according to industry analysts and some early users.

Missing link

On the other hand, popular graphical tools such as Powersoft Corp.'s PowerBuilder do not yet incorporate features that address the high-end needs of companies exploring the bleeding edge of client/server development, analysts said. PowerBuilder 4.0, also announced last week, seeks to address some of those concerns, however.

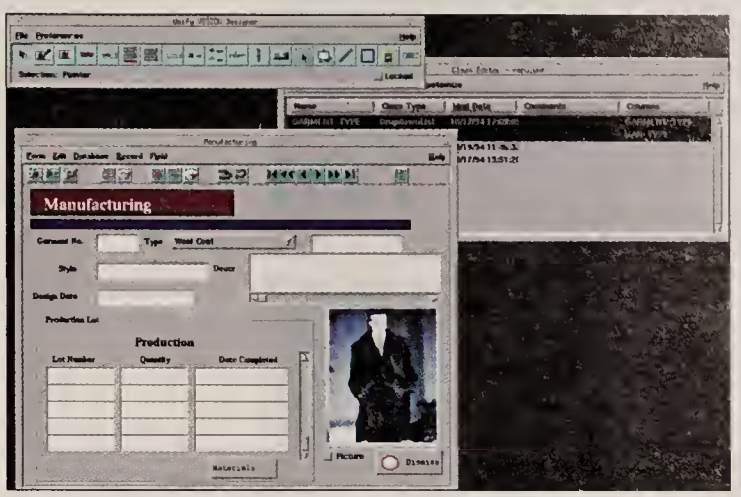
"Unify's Vision Release 2 presents a developer with a similar environment to some of these leading client/server development tools," said Chet Geschickter, an analyst at Hurwitz Consulting Group, Inc. in Watertown, Mass. "But what it adds is distributed computing capabilities such as directory services for tracking location of applications."

He added that because Unify is built on top of Visix Corp.'s Galaxy tool set, it allows Vision to be used across platforms.

Early development for client/server applications has primarily consisted of the straightforward access of databases using graphical tools, Geschickter said. But the market is now moving toward a distributed computing model, which allows developers to access multiple application resources and services, he said.

Price news

Unify's Vision Release 2 will ship in the first quarter of next year; a single-user development license is available for $4,995. Smart Pack, which includes five development and 10 deployment licenses, is priced at $25,000.



Unify's Vision Release 2 *features a scalable rapid application development and deployment architecture*

Customers now using Vision include Amoco Corp.; The Federal National Mortgage Association; Glaxo Laboratories, a division of Glaxo Holdings PLC; Merrill Lynch & Co.; and Nynex Corp.

David Fast, a technical director at Pacific Bell in Concord, Calif., opted for Vision to provide scalability for a group that expanded from five to 30 developers this past year and expects to grow exponentially.

"We have scalability concerns, and the price is right," Fast said. "The distributed capabilities are important also. I don't have to worry how I'm connected between an HP server and 486 or Sun clients, for instance. And it doesn't matter if I'm on an Informix database and want to switch to Oracle or Sybase — Vision will handle it."

The application developed by Fast's group handles administrative concerns that are critical to the company, although it does not require high volumes of transactions. The Vision application tracks the provisioning process, trouble reports and inventory of equipment related to packet services.

Vision's features include a scalable rapid application development and deployment architecture, automated application partitioning, a robust application model, cross-platform portability and object repository-based development.

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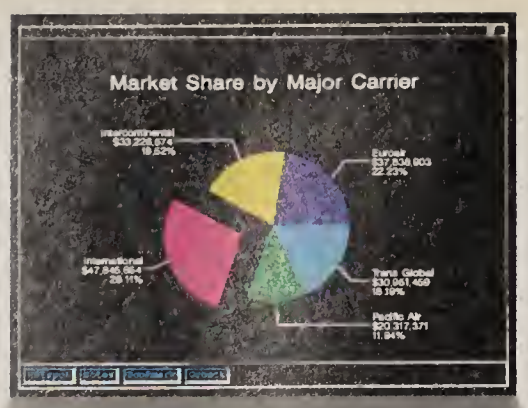

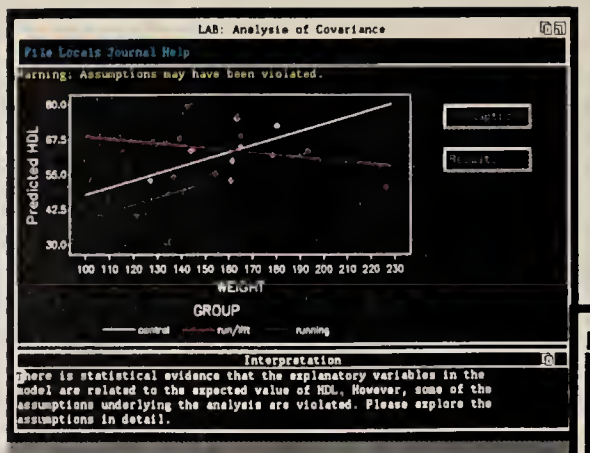

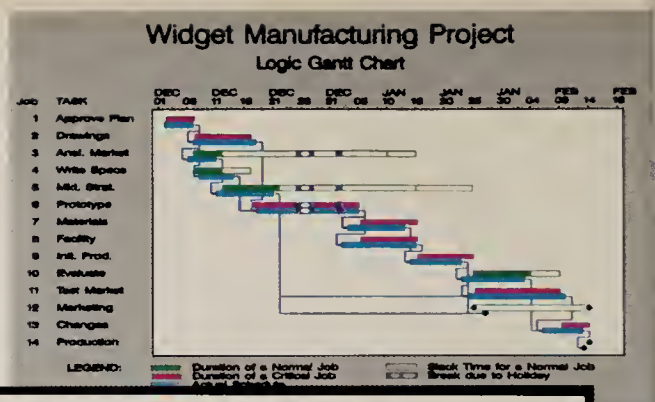

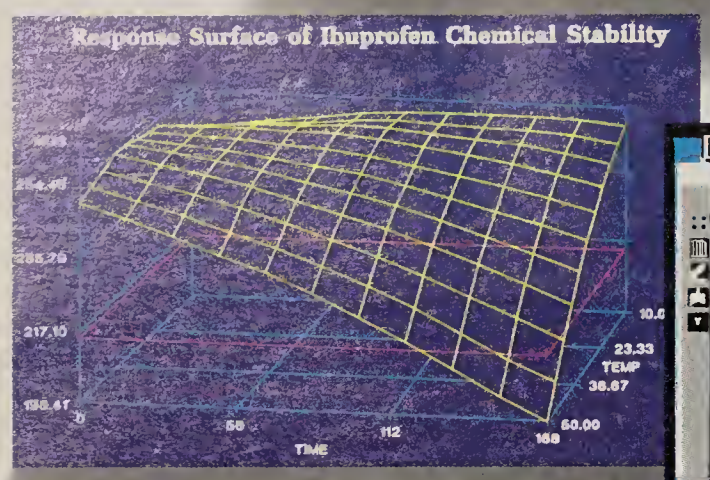

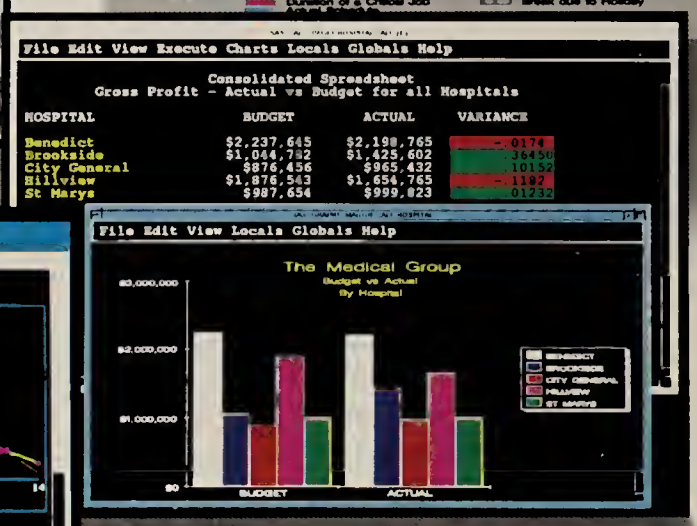

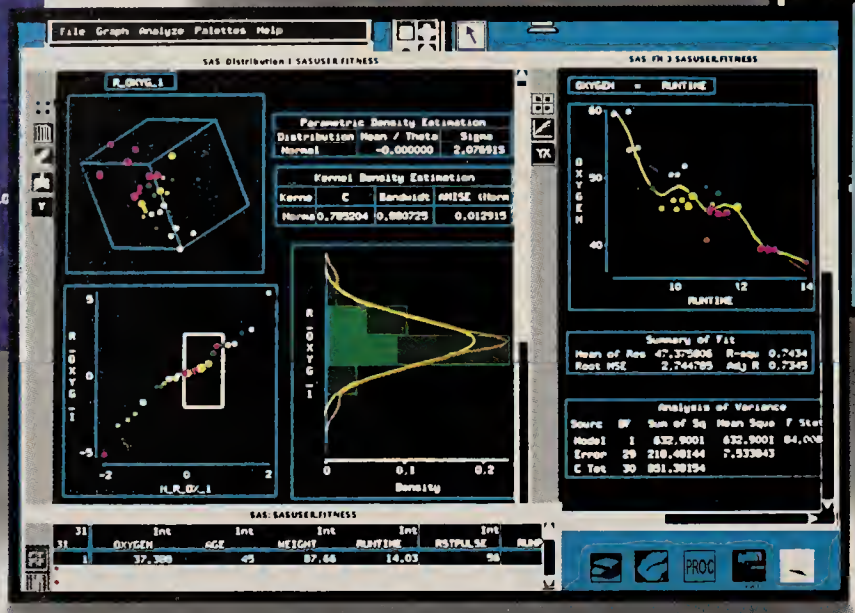

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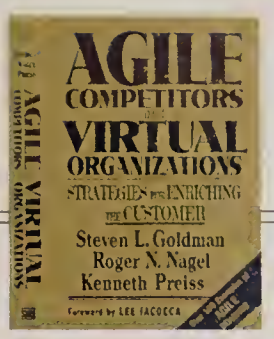

inside
An interview with the authors of *Agile Competitors and Virtual Organizations*. Page 100

360-degree evaluations

can turn IS teams into self-help groups, but IS staffs must first conquer the fear of life in a fishbowl

I'm OK, you're OK?

PHOTOGRAPHS BY RAY NG

HAMILTON STANDARD'S JAY KIRKSEY: *Employees are uncomfortable judging peers*

Probing as primal scream therapy, sensitive as Mr. Rogers and sinister as re-education camp, 360-degree performance appraisals ask employees to break a powerful taboo: Never, ever snitch on a pal.

But who is better able to judge the performance of team members than those with whom they work?

Three hundred sixty degree performance appraisal — sometimes called 3D or 360 — uses input on a person's job performance not just from supervisors but from the whole circle of people whose work life touches his: peers, internal and external customers, subordinates, self. To theoreticians, 360 looks

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BY KATHLEEN MELYMUKA

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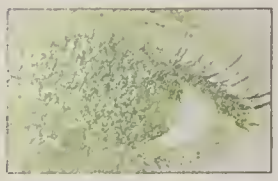

I'm OK

CONTINUED FROM PAGE 89

like the first step toward corporate utopia.

"When the team has input into appraisals, people learn to change behaviors and move from competition to cooperation," says Robert A. Zawacki, KPMG Peat Marwick distinguished scholar in residence at the University of Colorado at Colorado Springs.

But to team members, 360 may look like an artifact from the comrades who brought us the Great Leap Forward.

"People said, 'We came here for teamwork, and now you're trying to play one team member against another,' " says Jay Kirksey, who was director of human resources at Hamilton Standard Co. in Colorado Springs during its 360 implementation.

So for 360 to succeed, team members must be ready to praise Caesar, not just bury him. And managers must realize that this is scary new ground for many employees, who fear they could cost teammates their jobs.

Why implement it?

There's no denying 360 is a logical solution to the problem of evaluating self-managed teams, especially when nominal supervisors are often far removed from the action. A commitment to 360 puts a team-oriented corporation's money where its mouth is.

"If you truly believe teams make better decisions than individuals, you'll want to use" 360, says Diane Ragosa, vice president and general manager at Johnson & Johnson Advanced Behavioral Technologies, Inc. in New Brunswick, N.J.

The theory that a 360 assessment is more accurate is only part of its appeal. Equally important are the ideas that 360 fosters honest, effective communication throughout the workplace and that peer pressure is more likely to change behavior than an annual tete-a-tete with the boss.

Is 360 just another strategy of the month, or does it help people, teams and corporations perform better? That depends on corporate culture and commitment.

"It works better in a company where there's a requirement to rely on one another as members of a team," says Sue Methot, director of compensation at Bell Atlantic Corp. in Princeton, N.J.

"You can't say you want open and honest feedback and then hurt people when they give it to you," says Tom Sisk, manager of personnel relations and organization development at Ford Motor Co. in Colorado Springs. "If it's a closed system where covert operations determine success and people are playing games, then this won't work."

Roadblocks to success

Even with the right culture, companies trying to implement 360 face two major barriers: one emotional and one administrative.

Emotionally, the idea of criticizing a peer is profoundly unsettling to the average, nonconfrontational Joe. "People were not ready to sit down with a peer they had to work with and say, 'You were below average and missed this major component, and it came up to bite us,' " Hamilton Standard's Kirksey says. To elicit candor, many companies allow anonymous, written input. "We have not considered face-to-face," Johnson & Johnson's Ragosa says. "I don't think you'd ever get the honesty you get this way."

Others work through the reluctance. At Ford, self-managed team members can choose from two 360 formats. In one option, team members take turns leaving the room to allow the other members to discuss their performance. Comments are noted on a board and discussed with the employees when they return to the room. In the other option, each team member stays in the room during the same process to see face-to-face who is making the comments.

In both cases, "they found the fear was bigger than what really happened," Sisk says.

Secretive vs. confrontational

Madeline Weiss says she thinks face-to-face encounters are important to 360's success. "If everything is done anonymously, I don't think organizations, teams and individuals are nearly as well served as with open discussions," says Weiss, president of Weiss & Associates, a Bethesda, Md., consulting firm specializing in human resources.

At Chrysler Corp., input is anonymous, but there are open discussions afterward. "I expect all staff to sit down and talk about how I'm going to change my behavior based on the feedback I've got," says Susan J. Unger, executive director of information services at Chrysler in Center Line, Mich.

Whether input is anonymous or face-to-face, employees need to learn the fine art of constructive criticism. At Hamilton Standard, "we gave all kinds of training," Kirksey says. "We said, 'Focus around data, not feelings. If the deadline was March 1 and it wasn't done March 1, it's not that you don't like Goober; he just didn't get it done.' "

One strategy that is helpful — at least initially — is to use facilitators or coaches to keep face-to-face sessions on track. Another is to teach people to use behavioral descriptions rather than labels.

"You can't say 'incompetent,' 'silly,' 'lazy,' " Sisk says. "You have to use 'manages meetings well,' 'keeps to the agenda.' There's no useful information in saying, 'You're disorganized.' Instead you say, 'On this project you were late with reports five times.' "

People faced with participating in 360 are often fearful of the results, and those fears also

I'm OK, *page 96*

3D culture shock

While 360-degree evaluations provide managers with more complete profiles of team members' performance, convincing employees that the evaluations are in their best interest is no easy task

ADVANTAGES	DISADVANTAGES
More accurate appraisals	Fear of endangering another's job
Confirmation/refutation of gut feelings	Discomfort with judging peers
Honest communication	Feeling of competition
Behavioral change	Piles of paperwork
Reduced tension and conflict	Intensive time commitment

> "You can't say you want open and honest feedback and then hurt people when they give it to you. If it's a closed system where covert operations determine success and people are playing games, then this won't work."
>
> —TOM SISK, MANAGER OF PERSONNEL RELATIONS AND ORGANIZATION DEVELOPMENT FORD MOTOR CO. COLORADO SPRINGS

Back to behavioral basics

For self-managed teams to use 360-degree performance evaluations successfully, team members and managers must master some very basic behavioral skills

MANAGERS: PAVING THE WAY	TEAM MEMBERS: GIVING POSITIVE PEER PRESSURE
Teach constructive criticism methods to employees	Focus on facts, not feelings
Reduce fear of the appraisal results	Use descriptions, not labels
Use coaches to keep face-to-face sessions on track	Provide balance of praise and criticism

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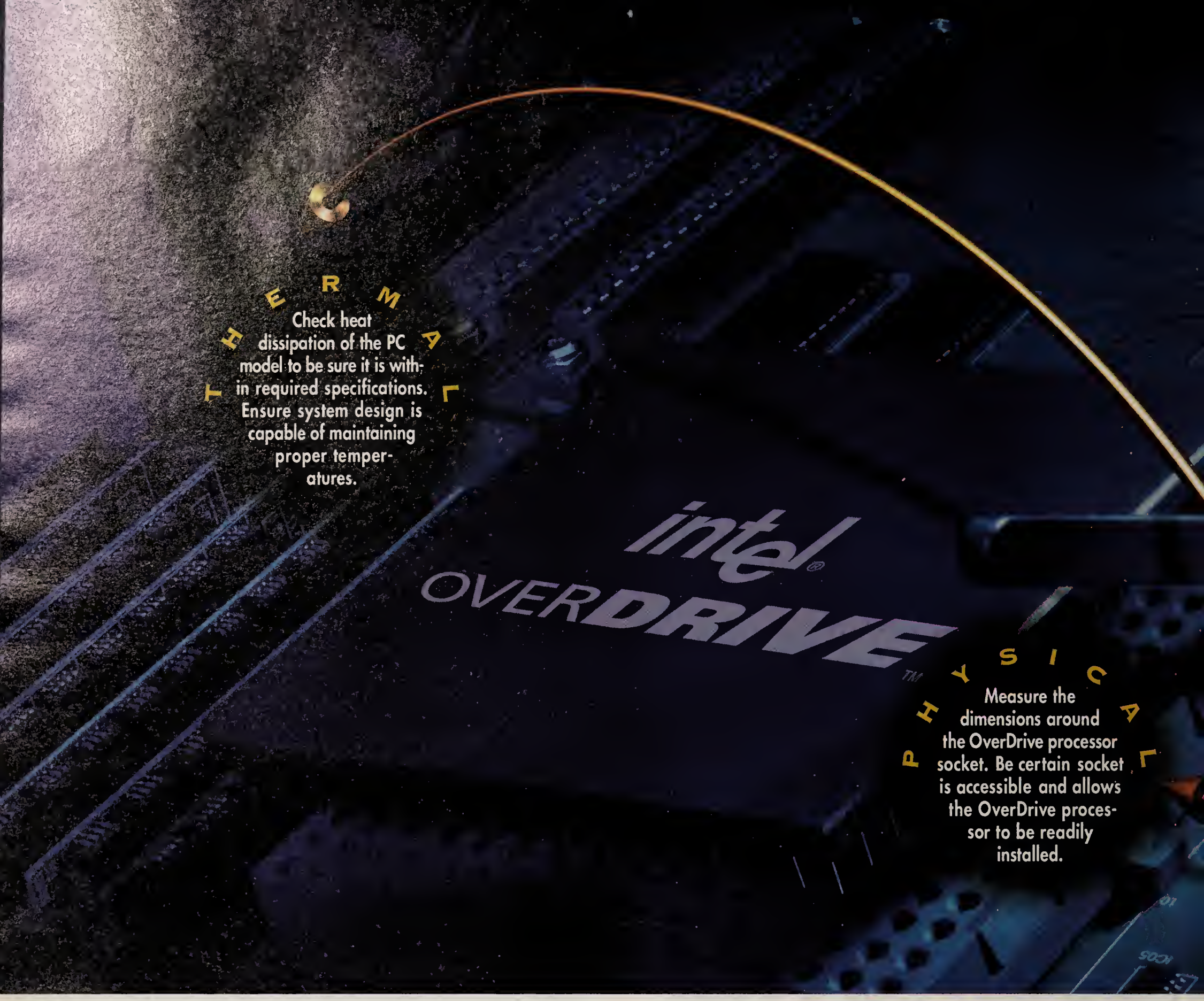

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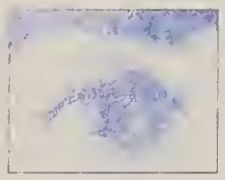

I'm OK

CONTINUED FROM PAGE 92

need to be addressed.

"There was the fear that some people would get angry," Sisk says, "and that did happen. Some folks probably were crushed because they were perceived in a way they would not prefer, but as they changed their behavior, perceptions changed."

Given fair weight

Fear of negatively affecting a peer's merit increase or job security is the final emotional obstacle to 360. Many corporations assuage that fear by limiting their use of 360 input.

"That is one of the things we're struggling with," says Trish Barron, director of training and organizational development at Johnson & Johnson. "Is a 360 evaluation tied to job security and merit increases, or is it a tool used strictly for a personal development plan?"

> "360s can be massive and agonizing to work on, but the more people who evaluate, the better picture you get."
>
> — DIANE RAGOSA, VICE PRESIDENT AND GENERAL MANAGER JOHNSON & JOHNSON ADVANCED BEHAVIORAL TECHNOLOGIES, INC. NEW BRUNSWICK, N.J.

At Bell Atlantic, 360 is strictly an employee development tool. More typically, 360 is only one of a variety of tools a company uses to help assess employee performance.

So little time

Even if employees are OK with this emotionally, administration is another story. If managers don't suffocate in the mountain of paper 360 creates, they may grow old coordinating, collecting and correlating input. The burden of providing 360 input is taxing enough, but the task of riding herd on seven to 30 appraisals per employee — where once there was one — can be downright crushing.

"The program brought the facility to its knees in terms of trying to administer it," Kirksey recalls.

This is understandable. A single 360 appraisal can eat up anywhere from a day and a half to a full week of combined staff time. Unfortunately, there is a direct relationship between the richness of the feedback and the weight of the administrative load. Ragosa acknowledges that 360s can be "massive and agonizing to work on, but the more people who evaluate, the better picture you get."

Championing the cause

So what's at the end of this trail of angst, anxiety and administration? People using 360 cite numerous benefits.

For supervisors, "it provides either corroborating testimony or refuting testimony about your feelings about the performance of an individual," Ragosa says.

For team members, "it's a much fairer, more honest appraisal process," Unger says.

"Those whose work is poor can't hide anymore, and those who do well get recognition," Sisk agrees. Culturally, "there is a noticeable reduction in tension and conflict," he adds. "Gripes are current rather than saved up. Little problems don't become big problems as much as they used to."

Is 360 worth it? Having been in the trenches at Hamilton Standard, Kirksey, currently director of human resources at Alert Centre, Inc. in Englewood, Colo., provides a clue. "There are aspects that are worthwhile, and I think there's a smart way to do it," he says. "Alert Centre is looking into 360, and I'm championing the cause." ■

Melymuka is a free-lance writer in Duxbury, Mass.

A smart way to spe

Calendar

NOV. 12-18

21st Annual Computer Security Conference and Exhibition. Washington, Nov. 14-16 — Topics will include security issues, client/server, electronic mail, the Internet, telecommuting and business continuity. Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2626.

Symposium on Operating Systems Design and Implementation. Monterey, Calif., Nov. 14-17 — Contact: Zanna Knight, Usenix Association, Berkeley, Calif. (510) 528-8649.

14th International Software Testing Conference: Bringing the Software Testing Process to Maturity. Orlando, Fla., Nov. 14-18 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Comdex/Fall '94. Las Vegas, Nov. 14-18 — Conference showcases include network computing, EnterNet, multimedia, OEM sources, office systems, desktop publishing and Integrated Services Digital Network solutions. Keynotes: Bill Gates, chairman and chief executive officer of Microsoft Corp., and Andrew S. Grove, president and CEO of Intel Corp. The cost for attending all conference events is $550 for all days, $450 for two days, $325 for one day and $195 for the International Marketing Forum. The cost for attending only exhibits is $75 for all five days; a $100 pass includes all exhibits for five days, plus keynote speeches and "power panel" seminars. Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Developing and Implementing Information Systems For Sales and Marketing Applications: Field Sales Systems, Database Marketing, Telemarketing and Customer Service. Boston, Nov. 15-16; Chicago, Dec. 6-7; San Jose, Calif., Jan. 9-10; and Atlanta, Jan. 18-19. Contact: The Perera Group, Andover, Mass. (617) 261-0112.

MIL-STD-1553 Seminar. Phoenix, Nov. 15-16 — The seminar is intended to help interpret requirements of the MIL-STD-1553 data bus. It covers definitions, protocol, terminal operation, hardware characteristics and design, software and systems design, test requirements and test equipment. Cost is $745 per person. Contact: Loy Marshall, Test Systems, Inc., Phoenix, Ariz. (602) 861-1010.

Eighth Association for Computing Machinery Symposium on User Interface and Software Technology. Pittsburgh, Nov. 15-17 — Contact: Brad Myers, Carnegie Mellon University, Pittsburgh, Pa. (412) 268-5150.

The Association for Manufacturing Excellence (AME) 1994 International Conference. Boston, Nov. 15-18 — Contact: AME, Wheeling, Ill. (708) 520-3282.

Fuzzy Logic Control: Theory and Applications. Atlanta, Nov. 16-18 — Contact: Department of Continuing Education, Georgia Institute of Technology, Atlanta, Ga. (404) 894-2547.

NOV. 26-DEC. 2

Sixth Annual Open Systems World/Fed Unix '94. Washington, Nov. 28-Dec. 2 — Conferences include Federal Open Systems, Motif/COSE International Users, Novell, Inc. AppWare Developers, Santa Cruz Operation Interoperability, Solaris Developers, Windows NT Developers, Linux International Users/Developers and World-Wide Web/Mosaic Users. Contact: Open Systems World, Inc., Laurel, Md. (301) 953-9600.

New York Virtual Reality Expo '94. New York, Nov. 29 — Contact: Schwartz Public Relations Associates, Inc., New York, N.Y. (212) 677-8700.

Mobile World: Improving Business Productivity Through Mobile Computing. Boston, Nov. 29-Dec. 1 — Topics include cellular/wireless communications, mobile and pen application development and integration, business automation and corporate management, mobile and electronic-mail-enabled technologies. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

The Field and Sales Force Automation Conference. Boston, Nov. 29-Dec. 1 — Topics include platforms for corporate headquarters, connectivity options, field access technologies, sales impact and corporate management. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Cause '94: The Annual Conference for Managers and Users of Information Technology in Higher Education. Orlando, Fla., Nov. 29-Dec. 2 — Contact: Cause, Boulder, Colo. (303) 449-4430.

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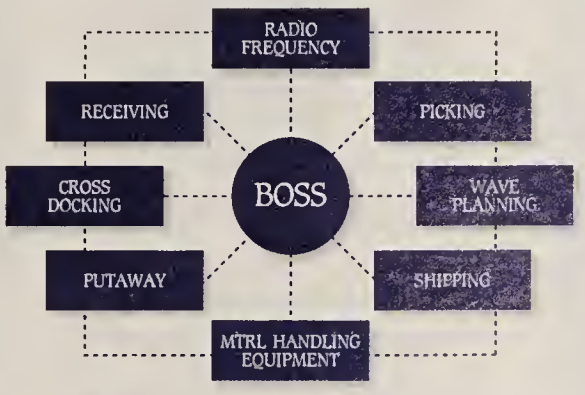

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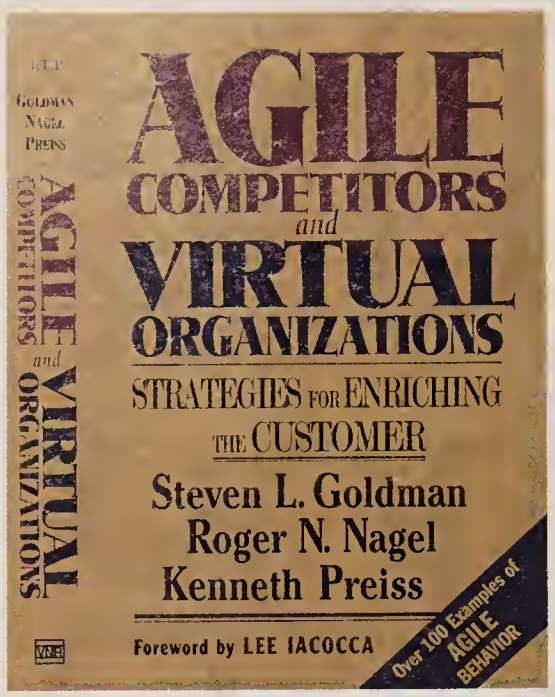


Jack be agi Jack be quick

by ALLAN E. ALTER

INFLEXIBLE SYSTEMS ARE HOLDING BACK COMPANIES THAT SEEK TO COMPETE ON AGILITY. GET WITH THE PROGRAM, SAY THE AUTHORS OF *AGILE COMPETITORS AND VIRTUAL ORGANIZATIONS*.

How can the U.S. secure its industrial base and regain manufacturing leadership in a global economy?

When the U.S. Congress and the Department of Defense sought the answer, they turned to the academicians and industrialists at the Iacocca Institute at Lehigh University in Bethlehem, Pa. In particular, they sought out professors Steven L. Goldman, Roger N. Nagel and Kenneth Preiss.

The three edited the influential 1991 report, "21st Century Manufacturing Enterprise Strategy: An Industry-led View," which helped popularize the concepts of agile competition and virtual companies. The report concluded that improving the mass production system of manufacturing was not the answer in a world full of competitors. U.S. industry should instead embrace new ways to compete made possible by new advances in information technology.

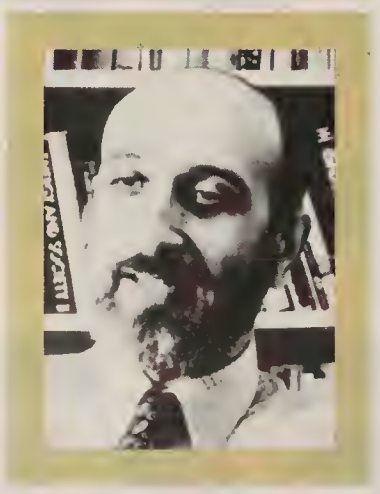
Agile competitors apply the new "flexible" manufacturing capabilities to quickly build high-quality, individualized products at low cost, no matter what the quantity. Simultaneously, they provide information and information-based services with these products, markedly increasing the value to the customer (or as the authors say, "enriching the customer").

By forming virtual companies (cooperative arrangements with companies offering complementary goods, services and skills), agile competitors can provide products and services that they could not otherwise offer. The way to take advantage of short-lived and unpredictable market opportunities, win and maintain loyal customers and keep profit margins high is to offer products and services that are perceived to provide exceptional value, according to the authors.

"An agile competitor can thrive in a business world of unpredictable and unrelenting change," Preiss says.

Now, after three years of additional research, the trio recently published *Agile Competitors and Virtual Organizations: Strategies for Enriching the Customer* (New York, Van Nostrand Reinhold, $29.95). The 400-page book describes the actions and strategies of companies that are making the transition to agility, from large firms such as The Boeing Co., Chrysler Corp. and Milliken & Co., to small, innovative companies such as Ross Operating Valve Co. (see story at right).

Allan E. Alter, *Computerworld*'s senior editor of management, recently asked the three authors to discuss how information systems fits into the world of agile competition and virtual companies. Their answer: Not as well as it should. The following interview was conducted last month by telephone.



"What's pulling agile competition is the profit potential of products and services that have customer-enriching potential."

– Steven L. Goldman

CW: How does moving to agile competition affect information systems and IS personnel?

PREISS: When I talk to different companies about moving toward agility, the one barrier that comes up every time is the inflexibility of the information systems and that IS people don't have a good understanding of the business environment. The barrier is not the production system or any other system.

In order to support agility, information systems need to be easily reconfigurable and interact easily between one system or company and another.

The move to open systems and object technology can be a significant tool for IS people, but they have to use them for the correct aim: dynamic reconfigurability for agility. Currently, objects are often used to create inflexible systems. It seems to me the tools are there, but the understanding of the strategic playing field needs to be put in place.

NAGEL: Information specialists hold the key to a company's strategic use of agility. They must therefore understand far better than they have in the past what a company's strategic goals and objectives are, how they can enhance them and be proactive in showing both management and customers the potential for information in their organization.

"Unlike re-engineering or total quality management, agile competition is not a new technique for an old game. It's an entirely new game with new rules."

– Kenneth Preiss

CW: Did you really mean "information systems specialist" when you said "information specialist"?

NAGEL: I would want someone who understands the information and the systems by which it is maintained. Today, the head of manufacturing has to know not just about manufacturing but the contribution of manufacturing to the firm. The same goes for IS.

PREISS: There is so much information that changes so rapidly, with so many questions as to how accurate and up to date it is, that there needs to be systematic methodologies to deal with information issues.

CW: How does becoming an agile competitor or a virtual company affect a company's information needs?

NAGEL: You need to begin to accumulate information about your customers so you understand what they need and what they like and how you can better enrich them.

With individualized products, you can't write a manual that's good for everybody. You want to move to self-documenting products, products that can tell users how to use the product more effectively. Excel has a "wizard" that automatically assists users by making suggestions. It's the beginning of a trend we'll see more of.

There's a strong push in an agile world to move from commodities to specialized products. One way is to add information to a commodity product. Federal Express Corp. did that neatly by providing a software package that allows customers to trace the status of their packages in their system.

GOLDMAN: Even the ability to build to order in arbitrary quantities is made possible by the delivery of information through computer-controlled manufacturing technology. Both at the production level and at the marketing level, information is the key raw material for adding value in an agile competitive environment.

CW: What are the most crucial information technologies required for agile competition and virtual companies?

PREISS: Network technologies are clearly important, including groupware technologies, because operations among teams is key.

Another key capability is mining for information, not only within your company but around the world. Developing techniques for those capabilities is important, such as software agents, which you provide with key words, and they then run around a network bringing back information wherever they find it.

"Agile competition means producing things designed to meet specific customer needs, which is the exact opposite from the one-size-fits-all, mass production philosophy."

– Roger N. Nagel

This implies a lot of work on standardization. To the extent which information people cannot agree on standards, they will hinder their own development. To the extent systems are open, they will increase the opportunity for everyone.

NAGEL: Information systems allow you to organize the work force and produce individualized goods and services — to have 100% lot traceability, to make each manufacturing operation slightly different from before. Databases are an important technology because of that.

CW: What qualities must databases have to support agility and virtual organizations?

NAGEL: They need to be flexible and nimble to permit you to use information in ways you didn't anticipate when you designed the database.

CW: Is client/server or distributed computing required to enable a firm to become an agile competitor?

PREISS: The point is not client/server or object [technology, per se], but how they are used. Systems should be designed for constant change and reconfiguration. Companies should be able to exchange information as routinely as computer users plug in video monitors.

CW: In your book, you say: "If there is gain in the future, the path to it lies through pain." What pain is in store for IS managers and professionals in the transition to agile competition?

PREISS: I think everything we have described is not at all easy to implement. Standardization is not easy. Making systems reconfigurable is not easy.

GOLDMAN: Decentralizing control and maximizing access to information is painful. Finding the optimal balance of access to information and protecting core proprietary information will be a very difficult balance to find and maintain. In a dynamically changing competitive environment, what information is valuable and what isn't changes rapidly. The balance has to be constantly adjusted, and information specialists have to have higher and higher levels of expertise.

CW: How should IS management conduct itself in order to accomplish this?

NAGEL: I think the role IS management must evolve into is one of facilitator. Being a good facilitator is quite a challenge. Helping the organization sort out strategic opportunities for information use from tactical ones that do not yield benefit will require great wisdom on the part of IS management.

PREISS: It's very important for IS managers to understand the changing systems of international commercial competition. In many senses, they hold the key to the [firm's] capability to compete in a world of constant change. The first order of business is to understand the new world. ■

AGILE AUTHORS

The publisher of *Agile Competitors and Virtual Corporations* practices what the book's authors preach. New York-based Van Nostrand Reinhold is offering corporate customers customized editions of the book based on their specific needs.

PROFILE IN AGILITY: Ross Operating Valve

Ross Operating Valve Co., an established manufacturer of hydraulic valves, has achieved extraordinary market success from converting its Lavonia, Ga., plant to what it calls the Ross/Flex valve manufacturing system.

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Beginning this year, Ross offered customers with in-house engineering capabilities the option of remotely accessing its design software and library for a fee, designing their own valves and downloading them to Ross production machinery for manufacturing.

All Ross/Flex personnel are cross-trained in all skills required for working with customers to design and produce valves, and all are responsible for sales, design, production, delivery and customer service.

From Agile Competitors and Virtual Organizations: Strategies for Enriching the Customer. *Reprinted with permission from the authors.*

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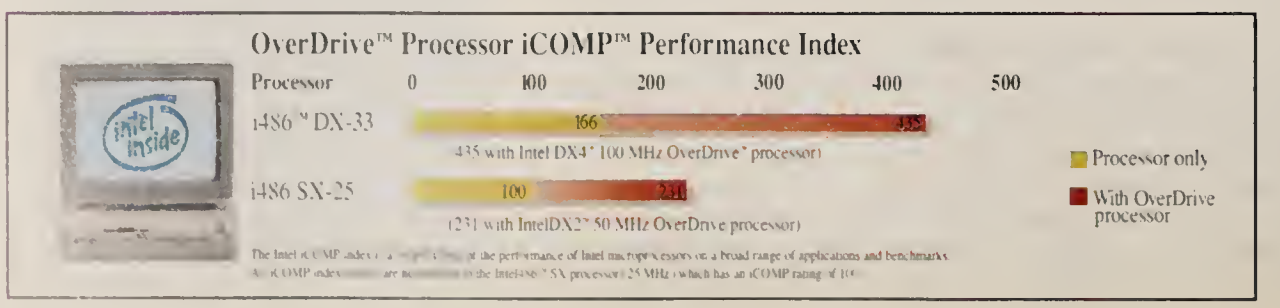

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RENOVATE

[DON'T OBLITERATE]

By Ron Berry

The Federal National Mortgage Association's (Fannie Mae) information systems group must respond to requests to deliver defect-free, low-cost, feature-rich technology applications *yesterday*. A client/server architecture seems the logical choice to do so; after all, it will let us deliver rich applications with fancy graphical user interfaces to wow users. But how do we take advantage of client/server without killing our multimillion-dollar investment in mainframe technology?

Our concern is not only with our investment, however. A radical and complete overhaul of our mission-critical systems is too risky an approach for an organization that has billions of dollars flowing through it every month. **Renovate,** *page 109*

Fannie Mae didn't want to lose its multimillion-dollar investment in its legacy applications. So it decided to integrate existing mainframe apps with newer client/server technologies instead of blowing old systems away.

Berry is an IS project manager at Fannie Mae in Washington and a 13-year industry veteran. He works in Fannie Mae's advanced technology group, which focuses on application architecture.

ILLUSTRATION BY TIM GRAJEK

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We even designed the LTE Elite to make things easier in the office – with the SmartStation and MiniStation **expansion bases.** Both of these options feature built-in networking* and SCSI-2 capabilities for an instant desktop configuration– complete with ports for your full-sized monitor and keyboard. The SmartStation also adds expansion slots and bays, a spare battery charger and motorized docking.

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Renovate

CONTINUED FROM PAGE 105

For instance, even a simple rounding error in calculation in our Investor Reporting system, which processes hundreds of billions of dollars each month, could cost millions of dollars.

It's just too risky for us to take our big transaction processing systems and change them all at once to less sophisticated Unix platforms. And spending large amounts of money without delivering a significant amount of features is not acceptable to our users.

So we hit upon the approach of "application renovation." (The "we" in this case is a project team of five people, including two IS staffers and three consultants from Cap Gemini America, Inc.)

Essentially what we're doing is looking at our mainframe applications and zeroing in on pieces of them we can integrate and transform with client/server technology. An effective application renovation strategy can help us master the integration of our 20 million-plus-line Cobol systems with our more than 30 Unix-based client/server applications. And it will help us reduce maintenance support costs and improve how quickly we deliver applications to users.

Our main targets include our large transaction processing systems. Our approach will be incremental and personal; our plan is to change the applications in three- to six-month increments using small, specialized teams.

Right now we are focusing our renovation efforts on our mainframe-based mortgage loan processing system, which processes more than 9 billion loans each month. This 2.7 million-line Cobol application, implemented in 1986, uses a CA-IDMS database from Computer Associates International, Inc. and impacts many systems.

In looking at the application, we knew we were already doing some of the right things. The application had already been streamlined to reduce processing times and redundant code. It was well documented. Our development group had already been successful in integrating new client/server features. For instance, it put in place a client PC front end using Microsoft Corp. Visual Basic and a server back end using Unix and a Sybase, Inc. database. The mainframe and server data was integrated and kept in sync via file transfer software.

Right now, we're in the process of dissecting the application further and looking for parts that are ripe for renovation.

That's just the first project we've taken on. But with it we've laid the groundwork to go through every one of our major mainframe applications to determine what needs renovating.

Our renovation projects for legacy apps will now consist of the following:

- Using analysis and modeling tools. We need to understand our environment completely. So we are mapping applications to specific business processes, defining process relationships, performing assessments to measure the effectiveness of a process and modeling a change before we change the process. The goal is to model and test assumptions before we start a major development or re-engineering effort.
- Building a repository to store environmental assessment information. The goal here is to use the repository to conduct "what-if" analyses to help manage and predict infrastructure changes.
- Reducing maintenance and support costs. The idea is to clean the application up on the mainframe first, cut cycle times, make processing more efficient and avoid trouble spots before they occur. We're looking at identifying specific batch processes that can be made online. Also, we may isolate system edits (business rules that frequently change)

Renovate, *page 113*

IN BRIEF

Fannie Mae facts

Number of employees: **3,400**
Number of IS staff: **890**
1993 net income: **$1.87 billion**
Annual IS budget: **More than $100 million**
Lines of Cobol code: **20 million**
Lines of C code: **1 million**

IT'S NOT HOW MUCH YOU READ.

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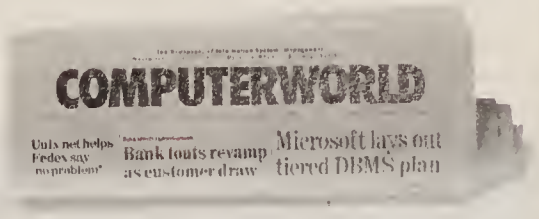

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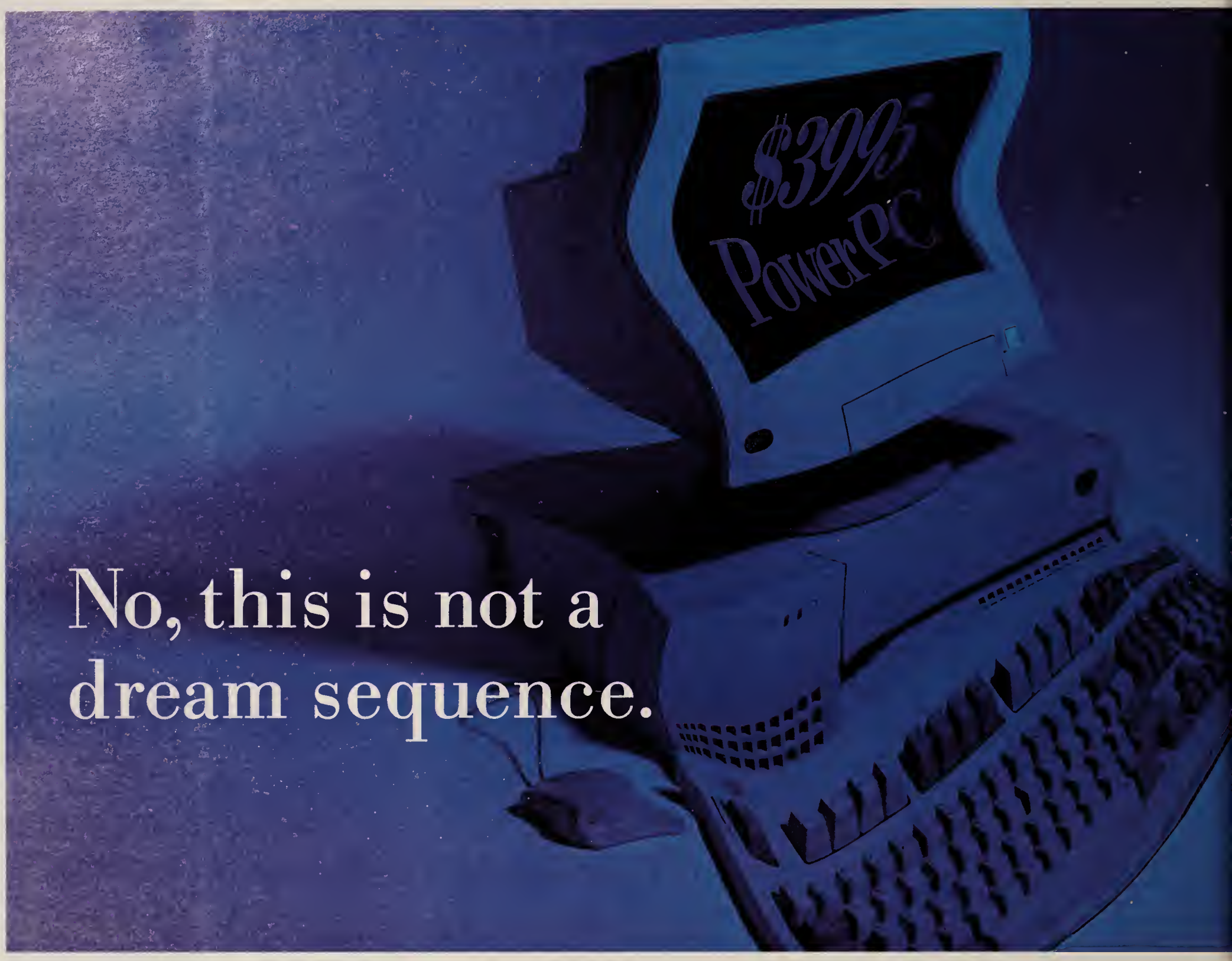

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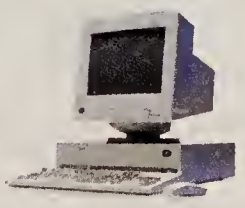

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Renovate

CONTINUED FROM PAGE 109

to make maintenance of these rules less cumbersome.

• "Mining" our current mainframe applications. The goal here is to retain business knowledge embedded in an application. We will use tools and manual techniques to identify, isolate and, in some cases, extract business rules and policy-based logic that tends to be buried in legacy apps. These rules can take the form of edits and validations.

The reason for mining applications is to identify and isolate the business rules and place them outside the application for easier maintenance of policy-based edits and validations. Mining also helps in cases in which an original developer or business user has departed or in cases in which the documentation is poor.

• Establishing formal interfaces to improve integration with other applications. We want to define standards to link applications effectively. Possibilities include file transfer software, application programming interfaces, remote procedure calls and middleware.

IN BRIEF

Fannie Mae's Processing Environment

- Mainframe apps run on IBM and Data General machines; database is CA-IDMS
- Client/server platforms include Compaq, Sun and Next; database is Sybase
- Fourth-generation language tools: Gupta s SQLWindows and Microsoft s Visual Basic and Visual C++

A range of options

What we have found is that not all of our renovation targets will likely be treated equally. Some need only quick strike improvements such as reducing maintenance and support costs and simple mining. We say these processes are going "zero distance."

"Middle distance" renovations are improvements that involve more complex changes, such as integrating two applications on different platforms.

We haven't yet implemented any "full distance" renovations, in which specific processes within applications would be extended on the same platform and integrated with specific processes that have been re-engineered, totally replaced or migrated to a new platform.

In terms of tools that can help us renovate, we are in the midst of assessing products that store repository information, integrate, analyze, model and transform our applications. Specifically, we want to support multiple users in PC LAN and Unix environments.

Five categories of tools are of interest:

• Complexity measurement tools that examine and analyze the source modules to determine structure and design complexity.

• Reverse-engineering tools.

• Renovation and restructuring tools that transform processes from one representation to another at the same relative abstraction level, while preserving functionality.

• Business simulation and modeling tools.

• Computer-aided software engineering tools.

Our burning desire to make client/server work with our legacy apps didn't come out of nowhere. It started at the top, with an initiative by our chief executive officer, Jim Johnson, who has pledged to include the use of technology to simplify the mortgage application process and reduce closing and origination costs for customers. That mandate compelled us to look at innovative ways to integrate and leverage our mainframe investment with client/server. Until today's technology matures enough to handle heavy-duty processing, we think application renovation can give us the best of both worlds.

Berry and his colleagues are working with Cap Gemini America to establish a Renovation Users Forum to share ideas and communicate them to vendor companies. To participate, contact Louis Salvaterra at Cap Gemini at (212) 944-6464. ■

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DABBLING in data

By Alan Radding

With all the talk about data as a valuable corporate asset, many companies are discovering a need for data administrators — people who help organize and maintain corporate data.

"We're seeing more demand for data administrators than ever before," says Tom Mayer, associate director at Source EDP, an executive search firm in Cleveland. Demand is primarily from large companies, with banks and service firms leading the way, he says.

In real numbers, however, the demand isn't overwhelming, at least not yet. Currently, Mayer is trying to fill three data administrator openings. But many companies are only just realizing the value of data. "We're going to see a lot of new openings — jobs that don't even exist today," says Michael Strauss, data administrator at BMG, Inc. in Indianapolis.

"Data administrators attempt to define and understand data as it relates to the business in nontechnical terms," says Barbara von Halle, principal at Spectrum Technology Group, Inc. in Somerville, N.J., a data modeling consulting firm. Data administration involves extensive modeling, and the primary deliverable is a logical data design or model. At large companies that really value data, this can evolve into something akin to a high-level consulting position such as a data architect.

Such is the case with Christopher Bond, data administrator at Public Service Gas & Electric Co. in Newark, N.J. He spends much of his time meeting with business managers to uncover how the business works, what information is needed and how it is used.

Even though many companies are becoming aware of the value of data, the career path for data administrators is virtually nonexistent at the moment

Definite distinction

Many organizations, however, confuse the data administrator with the database administrator. While the two should work together, data administration requires a strong business understanding, and database administration is more technically oriented, involving the tuning and indexing of relational database tables.

"The reality in smaller shops is that they try to combine the two roles," says Patricia Cupoli, a data consultant and vice president of education services at the Data Administration Management Association in Chesterfield, Mo.

Successful data administrators must have excellent analytical and communications skills, von Halle says. They should know relational theory and data modeling and be familiar with computer-aided software engineering tools.

There is a problem with a data administrator career: It lacks a clear career path. For instance, Joe Danielewicz, data administrator at Motorola, Inc.'s semiconductor product sector in Phoenix, began as a programmer/analyst and advanced to database administrator before becoming a data administrator.

But many don't have IS backgrounds. Bond has an accounting, finance and economics background and picked up his computer and database skills on the job. Cupoli has an MBA and worked as a librarian for nine years. Data administrator "training programs are just starting to spring up, but they are only in their infancy," Cupoli says.

In large companies, a data administration group may have a handful of data administrators and a manager. The problem is that administrators are caught in a no-man's-land between the business and IS. "You either go into consulting or you stay in IS and do architecture, standards and modeling," Danielewicz adds.

Although the data administrator position remains somewhat nebulous, administrators say they are confident that industry trends will prove their position more important. "As end-user data access tools get even more powerful, end users will need a liaison to help them understand what they are getting in terms of data," Strauss says. The most likely candidate is the data administrator. ■

Radding is a free-lance writer in Newton, Mass.

Creating Opportunities

A number of data administrators virtually create their own positions, often by asking questions about the data, where it comes from, what it means and what other data must accompany it. Telltale signs that your company is ripe for a data administrator include the following:

Embarking on business process re-engineering: You can't re-engineer a business without understanding and modeling the data and the processes that use the data.

Building a data warehouse: Somebody must understand what goes into the data warehouse, what it means and who can benefit from it.

Establishing a client/server architecture: This invariably leads to increased end-user demands for data access, which requires somebody to organize the company's data and guide users to it.

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Competition in the airline industry has squelched much of the opportunity to scratch out a technical career path from the bottom. Instead, more opportunities are coming from airlines' IS spin-offs.

Not so friendly skies

By Leslie Goff

Rick Mengel joined American Airlines in 1980 supporting mainframe printers. Through training provided by American and persistence, he worked his way through mainframe programming to PC coordinator in 1986 — just as PCs were emerging as true corporate contenders.

Today, Mengel is the LAN administrator at American's Raleigh, N.C.-based reservation center. Working with advanced distributed technologies, he's responsible for applications support and training, as well as LAN administration and support.

Just four years ago, Hugh Watkins' career took a similar path. He signed on as a junior analyst coding the mainframe customer reservation system at Delta Air Lines in Atlanta. With Delta-sponsored training in networking and Unix programming, he carved out a career in advaneed technologies.

He is now a senior programs analyst in the Unix Support Group, Delta's consulting and support arm for some of its most critical business and operations applications. He is responsible for Delta's Internet connection.

They don't make careers in the airline industry like they used to, however. Both Mengel and Watkins have seen hiring freezes as the industry struggled with increasing competition, consolidation and pressure to lower costs. System development cycles have accelerated dramatically in the airlines' move to become more agile and responsive to constantly changing market conditions.

"It's extremely difficult to start a career path within an airline the way I did," Mengel says. "The timing was good for me, but now you need to be experienced. You need to be able to come in and hit the ground running."

Even if you can hit the ground running, finding a full-time job at a major carrier is a challenge at best these days. The airlines' bread-and-butter customer reservation systems, which once guaranteed employment for large numbers of programmers and support staff, are being outsourced to new ventures, and massive mainframe applications are being outsourced or downsized to distributed platforms.

Opportunities exist

The industry is not without some long-term prospects, however. Although airlines are increasingly spinning off their informations systems function, they are creating new companies that offer a range of outsourcing services to the travel industry at large.

For instance, Delta recently announced a joint venture with AT&T Global Information Solutions that will absorb most of Delta's information technology function and staff. Delta is also a one-third partner with Trans World Airlines and Northwest Airlines in Atlanta-based Worldspan, which develops, markets and supports a customer reservation system for the travel industry and provides IS outsourcing services to airlines.

New positions

Hiring has slowed somewhat at Worldspan recently, but with the new year approaching, recruiting will likely pick up, notes Rick Watson, human resources representative at the company's operations and technology group. The company has opportunities in its customer reservation system area, which supports airlines and travel agents; its internal business development group, which supports internal operations; and its distributed systems group, which offers PC- and LAN-based products and services to travel agencies.

The three areas employ a wide spectrum of IS professionals, with positions in traditional data processing, mainframe applications, transaction processing programming and support, networking and communications, AS/400 applications development and PC and LAN development and support.

Like the airlines, Worldspan is seeking seasoned professionals. "We haven't had the luxury of bringing in programmers at entry level, which we'd like to do," Watson says. "But we have immediate needs that require experience."

Contract employment is another potential growth area in the airline industry. Watkins estimates Delta uses one contractor for every two to three full-time staffers.

"We're using a lot more resources, just not full time," Watkins says. "Whereas we had six months to complete a project two years ago, now they want it in six weeks. We have to gear up projects very quickly and then pull people off of them as soon as activity starts to trail off."

Contractors need cutting-edge skills in the usual areas: object-oriented programming, relational database management and administration and network programming and implementation. Hands-on project experience working with distributed technologies is also essential.

At Delta, airline industry experience is a plus, but "that's not a high priority because that's where [the full-time staffers] have experience," Watkins says. "We need more technical experience." ■

Goff is a free-lance writer in New York.

Airlines in motion

Delta's recent announcement that it will launch a joint information technology services venture with AT&T GIS illustrates the effect consolidation and outsourcing are having on IS career paths in the airline industry. Delta, which employs some 1,800 IS staffers, will spin off 1,200 people to the new venture.

Worldspan, an information technology services company in which Delta is a one-third partner, will absorb 300 customer reservation system support people. Some 200 will remain at Delta, "and some will not be offered a position at any of the three companies," says Hugh Watkins, a senior programs analyst at Delta.

Watkins says he sees good news in the churn, however. "As far as working for a major carrier, the chances are fairly low right now. But as more of these agreements like the Delta/AT&T venture come up, it will create a lot of opportunity."

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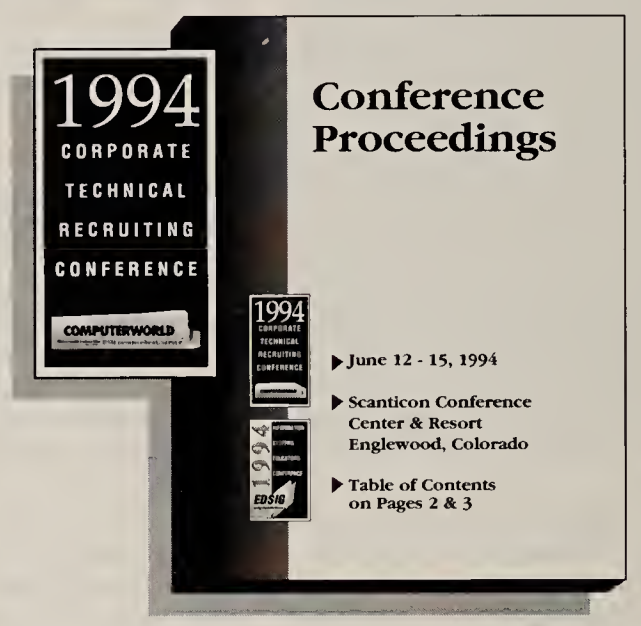

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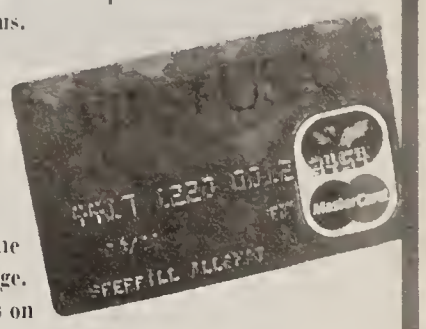

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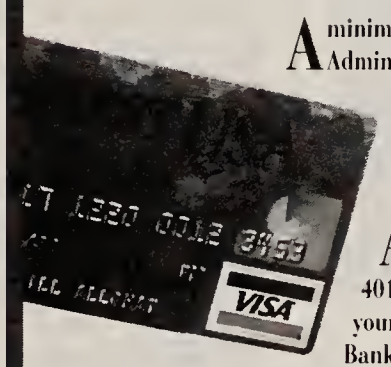

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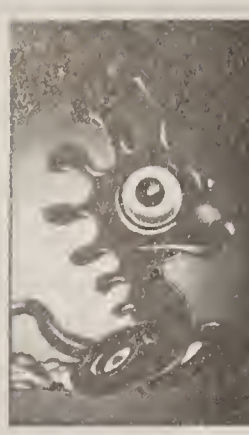

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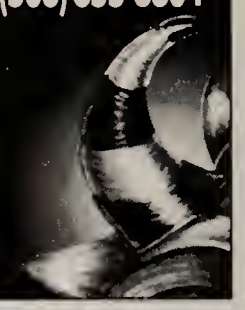

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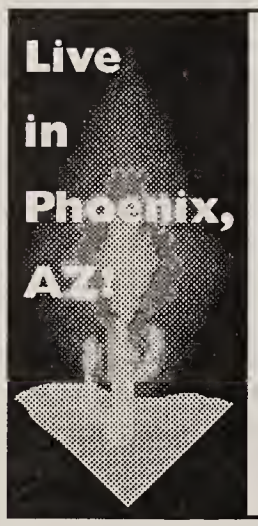

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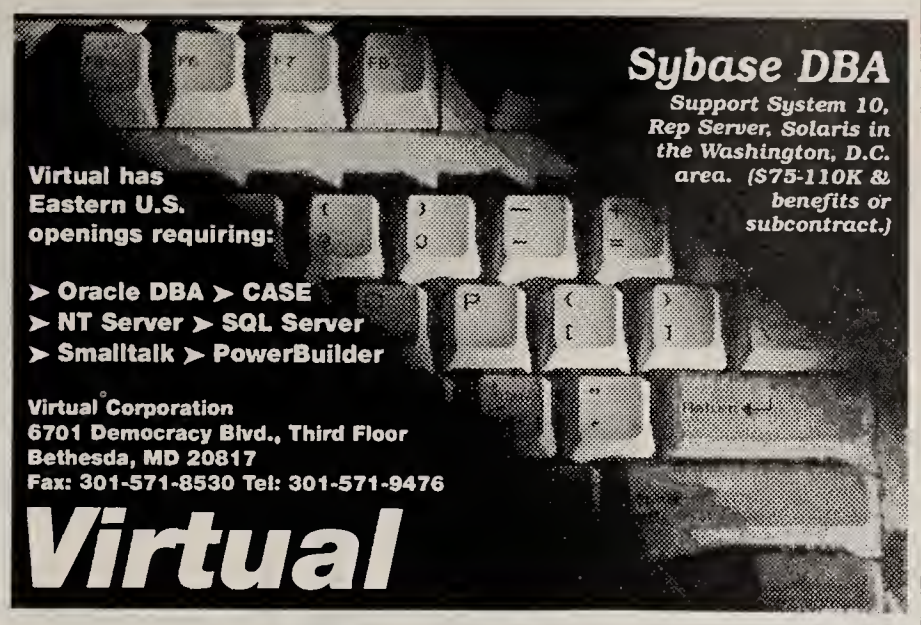

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DATABASE ANALYST

Candidates must have a BS in CS, a Life Science, or Engineering (or equivalent combination of education and experience). Position also requires 3+ years of experience working with computer hardware/software, to include at least 1 year of experience with Oracle database programming using SQL* Plus, SQR and RPL, excellent knowledge of the Mac operating system/hardware, DOS and Windows operating system. (Job Code: OXP-CW-2019)

DATABASE ANALYST

This position requires a BS/CS or equivalent combination of education and experience, 3+ years' experience developing relational databases (Informix preferred) and structure software. You must be a detail-oriented team player with excellent communication skills and the ability to work well with clients. (Job Code: OXP-CW-2028)

DATABASE ANALYST

A BS in the Physical Sciences or equivalent combination of education and experience is required. You must have 3+ years of experience in database design, with at least 1 year in a network environment and 2+ years creating and maintaining relational databases (4th Dimension preferred). (Job Code: OXP-CW-1932)

HVAC SYSTEM ADMINISTRATOR

Candidates must have a BS/CS or BS/EE with emphasis in computer control of industrial applications, or equivalent combination of education and experience; 3+ years' experience in operating and programming a computer-based environmental process control system; basic knowledge of HVAC systems; and excellent communication and time management skills. UNIX system administration experience is highly desirable. (Job Code: OXP-CW-1953)

SYSTEMS ADMINISTRATION-CIMS

Requires a BS/CS, BS/CE, or equivalent combination of education and experience. Ideal candidate will have 4+ years' experience with information system database administration to include customer/client support, hardware/software evaluation, acceptance testing, data integrity maintenance, and report generation. (Job Code: OXP-CW-2033)

DATABASE ADMINISTRATOR

Position requires a BS/CS or equivalent combination of education and experience, and 6+ years' computer experience. Ideal candidate will have 3+ years' database administration with a strong UNIX background including host management, software installation, management of NIS, DNS tables, data protection, and shell scripting. Experience with Oracle, Informix, Sybase/Sun Sparc, HP900/SunOS and Solaris is highly desirable. (Job Code: OXP-CW-1838)

DATABASE TEST ANALYST

A BS/CS or equivalent combination of education and experience is required. Candidates must possess 5+ years' experience writing test plans and conducting software tests in a UNIX, Mac or Windows environment, knowledge of change management procedures and ISO 9000 or DOD equivalent. Excellent communication and client service skills are a must. (Job Code: OXP-CW-2030)

LOGISTICS SYSTEMS ANALYST

A BS/CS, a BS in a related discipline, or equivalent combination of education and experience is required. We seek a team player with 3+ years' computer-related experience including programming/scripting, database management and development. Demonstrated knowledge of client/server technology, LAN technology and DOS, OS/2, or System 7 is required. Ideal candidate will have end-user support experience and excellent communication skills. (Job Code: OXP-CW-2081)

BUSINESS SYSTEMS ANALYST

This position requires a BS/CS, a BS in a related discipline, or equivalent combination of education and experience. Candidates must have 8+ years' business systems experience including design, coding, unit and integration testing, user acceptance testing, implementation, final documentation, training and maintenance in the AS400 environment. JD Edwards and Imaging experience, excellent communication and analytical skills, and the willingness to travel are also required. (Job Code: OXP-CW-2070)

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Ideal candidate will have a BS in CS, EE, Biological Science, or related discipline, or equivalent combination of education and experience. This position requires at least 2 years' multi-platform programming experience using languages such as C++, Basic and FORTRAN, plus one year of laboratory experience, preferably in a Biological Science. Excellent communication skills are a must. (Job Code: OXP-CW-2072)

PROGRAMMER/ANALYST

This position requires a BS/CS or equivalent combination of education and experience, at least 6 years' experience with database development including design, coding, unit and integration testing, user acceptance testing, implementation, final documentation, training and maintenance. Candidates must demonstrate proficiency with Informix. Ideal candidate will also possess knowledge of biology and the clinical trials process. (Job Code: OXP-CW-2071)

PROGRAMMER ANALYST

Candidates must have a BS/CS or equivalent combination of education and experience, 5+ years of Oracle & Informix programming/database design experience, including loading & merging data from vendors and the development of reports & screens using 4GL & PL/SQL. Working knowledge of Business System Life Cycle Model, Case Tools, Configuration Management Standards, Distributed Processing Principles, and UNIX Operating System is also required. The ideal candidate will be a team player with excellent communication skills. (Job Code: OXP-CW-2083)

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- Use of CASE tools (ADW, Bachman).
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SYSTEMS ANALYST

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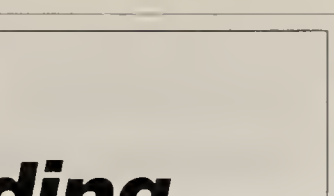

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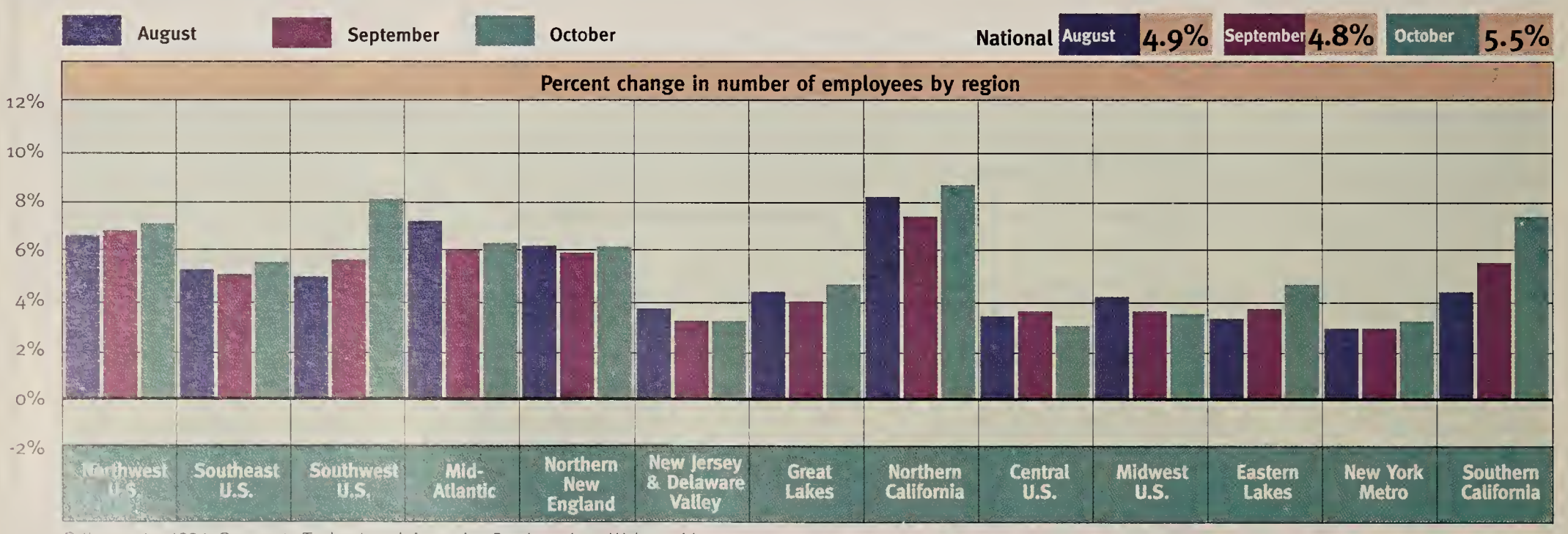

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What's New?

Multimedia capabilities and improved knowledge bases take center stage in high-end, Windows-based help desk software

By Alan J. Ryan

It's 9 p.m. You're making last-minute changes to a report and the printer stops. You type an electronic-mail message into your PC: "!@#$!! printer not working." The help desk software automatically assesses your hardware and determines the problem and a resolution. A "replace toner" message pops up, offering you written instructions or a multimedia demonstration on changing the cartridge.

Sound too good to be true? This scenario will be reality by year's end for some high-volume help desks, experts predict. Vendors of high-end products — those that go beyond call-tracking and management — are loading their Windows-based products with artificial intelligence, voice recognition, neural networks, case-based reasoning and multimedia capabilities. While these technologies are not exactly new, vendors are combining them to create help desk software involving less human interaction and frequently providing one-call problem resolution.

For example, voice-recognition technology when used alone is considered problematic at best, says Joe Adams, co-founder of Software Artistry, Inc. in Indianapolis. "One hundred percent voice recognition is a noble goal, but we're not there yet," Adams says. But by combining voice recognition with neural networks, the technology can be used to identify just key words. "That's a much easier problem to solve," he says.

Other hot applications are those that foster the "virtual help desk." These products let users and customers log, update and resolve incidents through E-mail. Multimedia-capable software enables on-screen demonstrations to be created and forwarded — technology permitting — to users' desktops. Software Artistry's Expert Advisor Client/Server 2.0 plans to be one of the first with this capability. Analysts say they hope such features help answer the "how-to" questions that make up the estimated 75% of help desk calls.

One of the most improved areas of help desk offerings is knowledge- and case-based systems. Products such as Inference Corp.'s CBR2 have built-in controls that eliminate redundant questions and answers. "The knowledge-based reasoning solutions help diagnose complex problems and provide fast answers to easier problems," says Kurt Johnson, manager of software services research at International Data Corp. (IDC) in Framingham, Mass.

Tracking problems

Answer Systems, Inc.'s take on this is its Apriori software. The product's patented "bubble-up" technology creates a knowledge tree of information in the system. An algorithm examines the problems facing users and modifies and keeps the Top 10 issues and resolutions "bubbled up" to the top. As problems change, the list automatically evolves.

"Bubble-up technology is definitely appealing," says Joe Schoen, technical support analyst at NEIC, Inc. in Secaucus, N.J. "When a support rep looks up a problem, he can see the top issues affecting all of our clients. As things change, these items keep moving off that list."

When employing knowledge-based systems, companies can hire a knowledge engineer to build a database of questions, problems and resolutions or buy prepackaged knowledge bases from applications vendors, says Rajiv Enand, vice president of ServiceWare, Inc., a help desk consultancy in Oakmont, Pa.

For one-stop shopping, products such as CD-ROM-based Support on Site (SOS) from Computer Library in New York contain prebuilt knowledge bases for more than 350 products.

While SOS is not directly integrated with the help desk software, integration with knowledge bases is possible. "Ideally, when you buy software, you [should be able to] buy knowledge bases for the products you support," Enand says.

The help desk software market is growing at a rate of 100% annually, according to Gartner Group, Inc. in Stamford, Conn., and is expected to reach $600 million in five years. Yet even with improved efficiency stemming from the new technologies, call volumes and durations will escalate, says Ron Muns, founder of the Help Desk Institute in Colorado Springs. More connectivity and client/server issues will create more connection problems and more questions.

That's where help desks fit in. "Help desks are supporting more products with fewer people," Enand says. As people become generalists, "they'll use expert systems or problem resolution technologies to give the depth of understanding of each of the products supported." ■

Ryan is a free-lance writer in Pascoag, R.I.

Top help desk technologies that companies plan to use in the next year

	Percentage of respondents
Problem call management	52%
Remote monitoring and support tools	24%
Text retrieval/on-line documentation	21%
Network management software	21%
Expert systems/artificial intelligence	18%
Automatic call distributors	18%
Voice response units	16%
Alert and display systems	14%
Change control software	14%

Base: 809 companies, multiple responses allowed
Source: Help Desk Institute, Colorado Springs

A dose of reality

If you want help desk software with multimedia capabilities and better knowledge bases, you'll have to pay for it. Prices go as high as $150,000, says Rajiv Enand, vice president of ServiceWare. About 75% of that goes toward the product and 25% for support or integration.

Such a breakdown leaves little room for price negotiation, but with high-end products, price takes a backseat to return on investment (ROI), says Kurt Johnson, manager of software services research at IDC.

But don't expect to buy a help desk solution today and solve problems tomorrow. Some products being paraded into the arena boast ROI in six months or less, with much of that savings coming from reduced phone expenses. Most systems, however, take six to 10 weeks to set up and run before seeing any real bang for the buck.

"What you're looking for are products that will reduce average call time, increase problem resolution rates and increase customer satisfaction," Enand says.

Network Management Tools

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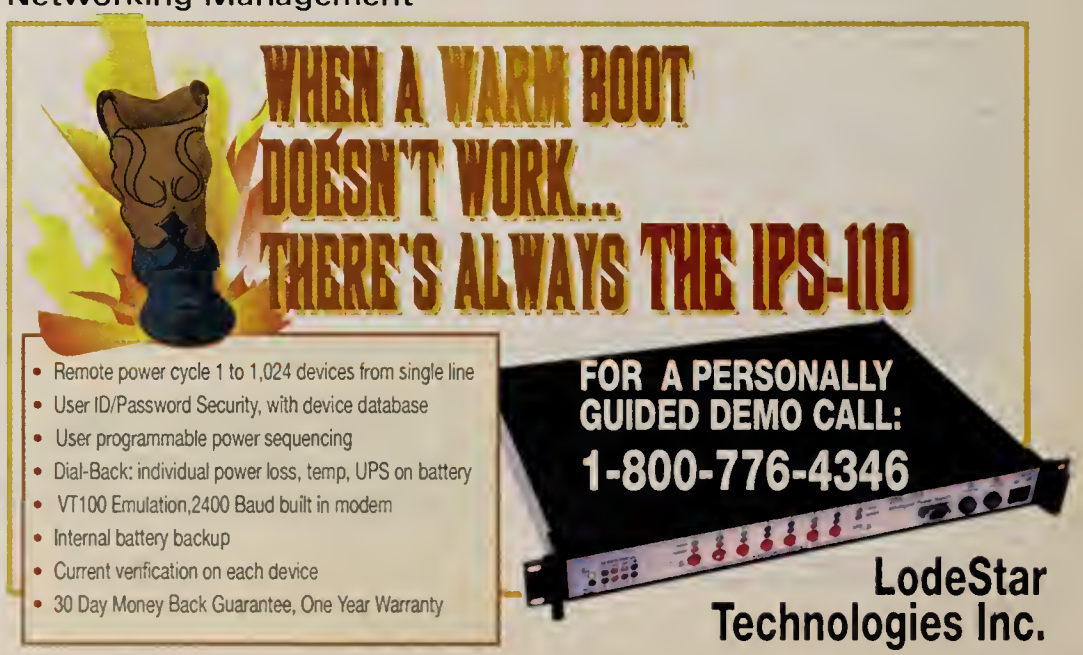

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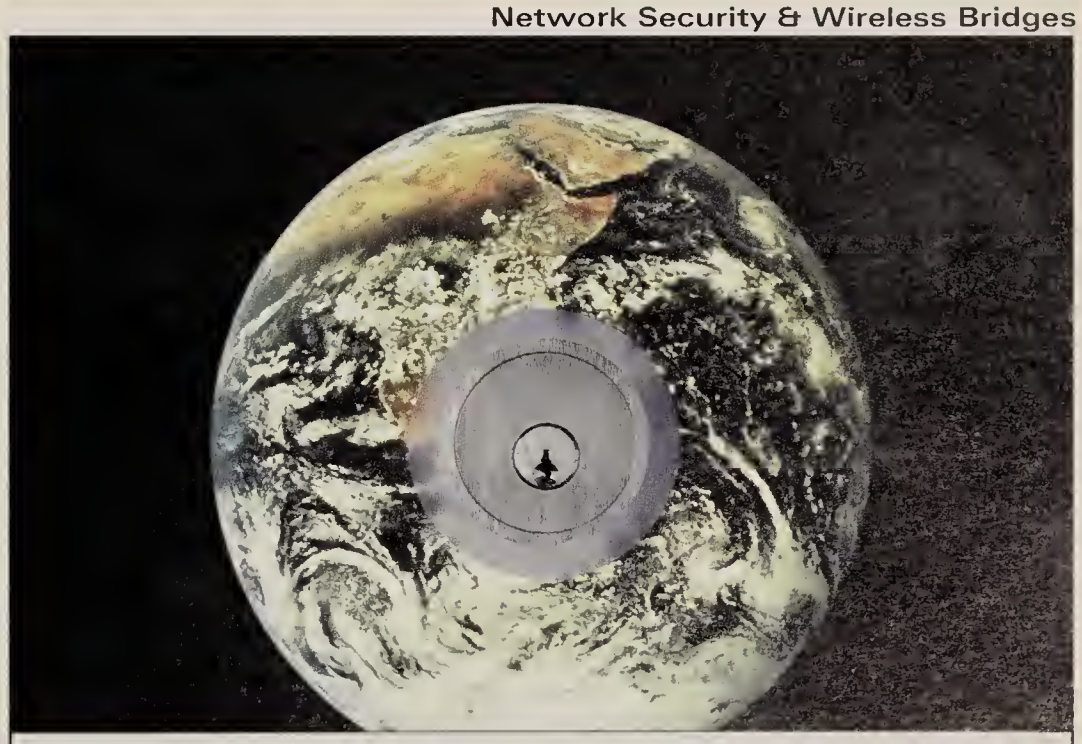

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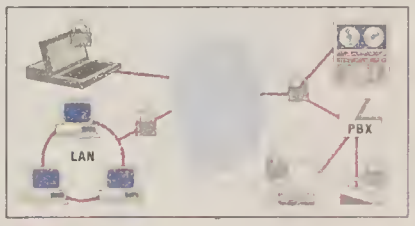

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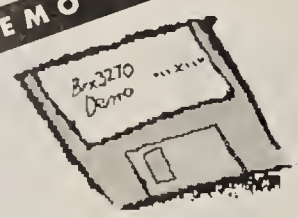

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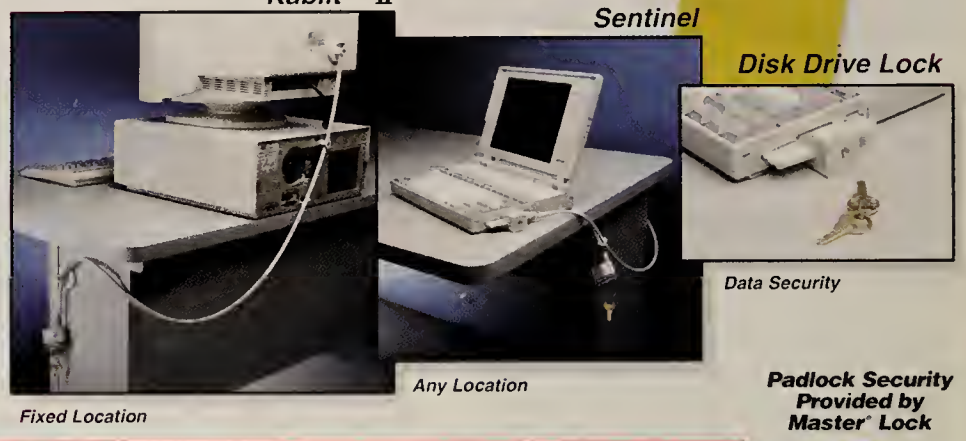

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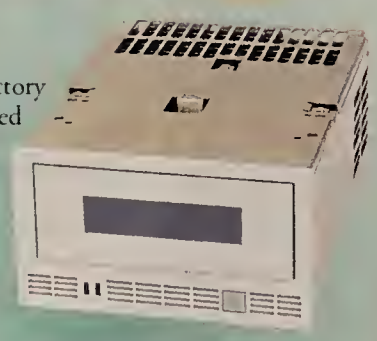

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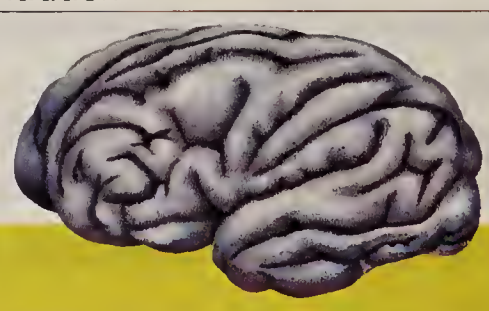

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NOTICE OF SOLICITATION

CONTRACT NO.: CMM-0947
Proposal Closing Date: Wednesday, November 30, 1994 at 4 PM local time.
TITLE: Consulting Oversight of Bus Passenger Origin-Destination Survey.
"Description of Services to be Proposed: Performance of ongoing expert oversight and quality control of bus passenger origin-destination survey on all N.Y.C. Transit and N.Y.C. - subsidized private bus routes being carried out independently under N.Y.C.T. Contract CMM-0948, by reviewing and advising as to all aspects of the study, from sample design to data collection to final analysis. It is preferable that Proposers have experience setting up and administering on-board bus passenger origin-destination surveys in large metropolitan areas, including skills in developing methods to query riders and geo-code origin and destination information to smaller areas (smaller than zip code)."

A Pre-proposal Conference is Scheduled for November 14, 1994, 2:00 P.M., at 130 Livingston Street, Conference Rooms 5 & 6, 6th Floor, Brooklyn, N.Y. 11201 Prospective proposers who desire to attend shall notify the Procurement Specialist no later than noon, November 8, 1994.

Proposal documents may be obtained at the Solicitation Counter at the aforementioned address from 9:00 AM to 3:30 PM Mon-Fri except holidays. Requests can be made in writing, in person or by telephone to the Procurement Specialist.

Sealed proposals will be received by the NYCTA at 130 Livingston Street, Brooklyn, NY 11201 at the Bid Solicitation Counter until the closing time and date. Proposals will be accepted until the stated closing date and time. Proposers will be fully responsible for the delivery of their bids in a timely manner. Reliance upon the U.S. Mail or other carriers is at the bidders risk. Late proposals will not be considered.

Procurement Specialist Alain Chirot (718) 694-4239.

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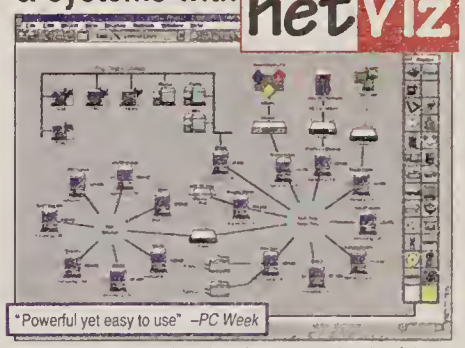

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Nov. 4 Stock Ticker

Gainers

Percent

Software Spectrum Inc.	28.6
Optical Data Systems Inc.	21.1
Bolt, Beranek & Newman	17.2
State of the Art	15.3
Microcom Inc.(H)	13.6
Interleaf Inc.	12.9
Bachman Info. Systems	12.5
Brooktrout Technology	12.5

Dollar

Chipcom Corp.(H)	4.75
Optical Data Systems Inc.	4.00
Software Spectrum Inc.	3.50
Bolt, Beranek & Newman	2.88
Powersoft	2.88
Stratus Computer Inc.	2.75
Cypress Semiconductor(H)	2.25
NetManage Inc.(H)	2.13

Losers

Percent

Rasterops	-19.4
Cambex Corp.	-14.7
Proteon Inc.	-11.1
Software Publishing Corp.	-10.0
ParcPlace Systems Inc.	-9.9
Iomega Corp.(H)	-9.7
Rainbow Technologies Inc.	-9.2
Gupta	-9.0

Dollar

Peoplesoft(H)	-4.63
Xilinx	-4.00
SynOpsys	-3.25
IBM(H)	-2.75
ITT Corp.	-2.25
Xerox Corp.	-2.25
Autodesk Inc.	-2.25
Sybase Inc.	-2.25

Cypress Semiconductor rode a favorable investment rating to a new 52-week high. At the same time, Software Publishing Corp. and PeopleSoft, Inc., top gainers the previous week, saw their share prices drop off.

Industry Almanac

No time for a station break

Things are going fast and furious in the workstation sector these days, thanks to growth led by three-dimensional and graphics computing stations and the popularity of so-called personal workstations. In fact, three of the leading issues in the market, **Sun Microsystems, Inc.**, **Hewlett-Packard Co.** and **Silicon Graphics, Inc.** (SGI), all hit new 52-week highs last week.

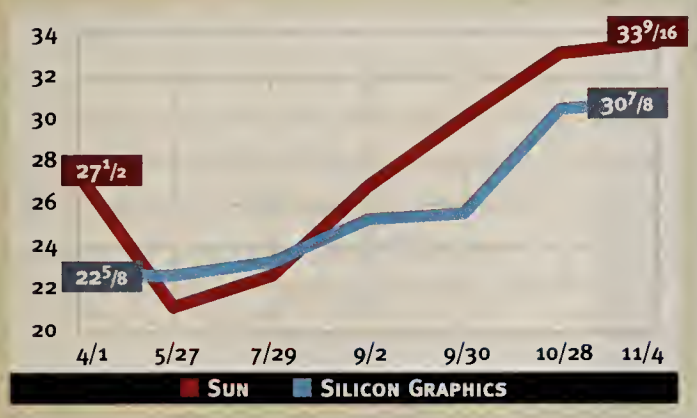
According to Jeffry Canin, an analyst at **Salomon Brothers, Inc.** in San Francisco, SGI blew through expectations for the past quarter. "The almost unbelievable aspect for SGI is that [it is] on a $2 billion run rate," he said, with revenue accelerating for the third year in a row. He pointed out that while SGI dominates the visualization niches, it has also broadened its customer structure to offer capabilities to other workstation users.

Facing this rising competition is Sun, the current market leader. Richard Chu, an analyst at **Cowen & Co.** in Boston, said Sun has been on the defensive for the past two to three years. "There was a perception that Sun has not had the leadership position from a performance standpoint," he said, being outgunned by the likes of SGI, HP and **Digital Equipment Corp.** He noted that with the launches of its SPARCstation 5 and SPARCstation 20 products in April, Sun closed the performance gap and saw orders rise.

But SGI expects to continue its surge. "As big as [it has] become, [it is] still looking for 40% revenue growth," Canin said. *—Tim Ouellette*

Rising Sun

Sun and Silicon Graphics stock performance since April



Exch	52-Week Range			Nov. 4 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**UP 2.04%**
OTC	43.00	16.00	3 COM Corp.	40.63	-0.88	-2.1
NYS	43.38	36.25	AMERITECH Corp.	39.38	-1.00	-2.5
NYS	57.75	49.50	AT&T	54.25	-0.13	-0.2
OTC	26.50	12.75	8anyan Systems Inc.	17.75	0.00	0.0
OTC	43.88	18.63	Bay Networks Inc.	27.00	2.00	8.0
NYS	64.50	49.00	Bell Atlantic Corp.	52.00	-0.13	-0.2
NYS	63.50	50.75	Bellsouth Corp. (L)	51.50	-0.88	-1.7
NYS	21.50	10.00	Bolt, 8eranek & Newman	19.63	2.88	17.2
OTC	15.75	9.00	Brooktrout Technology	11.25	1.25	12.5
NYS	53.00	33.06	Cabletron Systems	50.00	0.13	0.3
OTC	43.00	10.00	Centigram Communications	19.50	1.00	5.4
OTC	64.50	31.50	Chipcom Corp. (H)	64.50	4.75	7.9
OTC	40.75	18.75	Cisco Systems Inc.	31.88	1.75	5.8
OTC	16.63	7.88	Compression Labs Inc.	8.56	-0.19	-2.1
OTC	12.38	5.13	Computer Network Tech.	6.88	0.13	1.9
OTC	32.00	7.50	CrossComm	10.50	0.94	9.8
OTC	3.00	1.50	Data Switch Corp.	2.50	0.00	0.0
OTC	35.00	17.88	DSC Communications	30.13	-0.69	-2.2
NYS	34.00	8.25	General Datacomm Inds. (H)	33.75	1.50	4.7
NYS	38.50	29.50	GTE Corp.	30.75	-0.13	-0.4
NYS	95.97	78.63	ITT Corp.	86.50	-2.25	-2.5
OTC	29.00	21.38	MCI Commmunications Corp.	22.75	0.25	1.1
OTC	9.38	2.63	Microcom Inc. (H)	9.38	1.13	13.6
OTC	29.75	11.25	NetManage Inc. (H)	29.75	2.13	7.7
OTC	7.25	4.00	Netrix Corp.	6.75	0.13	1.9
OTC	8.75	3.25	Network Computing Devices	4.00	0.25	6.7
NYS	22.25	7.38	Network Equipment Tech. (H)	20.63	-0.50	-2.4
OTC	23.38	12.50	Network General	20.63	0.75	3.8
OTC	9.63	6.38	Network Systems Corp.	6.88	-0.19	-2.7
NYS	68.75	26.50	Newbridge Networks Corp.	28.38	-1.00	-3.4
NYS	37.75	26.00	Northern Telecom Lto.	34.00	-1.88	-5.2
OTC	26.63	13.38	Novell Inc.	18.13	0.75	4.3
NYS	43.75	33.25	Nynex Corp.	38.88	-0.13	-0.3
OTC	30.00	15.50	Octel Communications Corp.	21.25	0.00	0.0
OTC	23.00	10.75	Optical Data Systems Inc.	23.00	4.00	21.1
OTC	7.50	2.75	Penril Data Comm Networks (L)	3.00	0.00	0.0
OTC	20.75	10.00	Picturetel Corp.	20.00	1.00	5.3
OTC	8.25	2.13	Proteon Inc.	6.00	-0.75	-11.1
OTC	14.38	2.75	Racotek Inc.	4.38	0.00	0.0
NYS	23.25	12.44	Scientific Atlanta Inc.	21.13	-0.75	-3.4
NYS	45.25	36.75	Southwestern 8ell Corp.	41.63	0.50	1.2
NYS	40.13	31.38	Sprint Corp.	33.13	0.50	1.5
OTC	26.75	13.38	Standard Microsystems Corp.	24.75	1.50	6.5
OTC	59.00	13.00	Stratacom Inc. (H)	58.88	0.63	1.1
OTC	15.25	3.88	Telebit Corp.	4.63	-0.25	-5.1
OTC	46.00	23.00	US Robotics	39.00	0.88	2.3
NYS	48.25	35.63	US West Inc.	37.75	0.00	0.0
OTC	28.25	12.75	Xircom	17.25	-0.25	-1.4
OTC	31.50	13.25	Xylogics Inc. (H)	29.00	0.00	0.0
OTC	28.13	11.25	Xyplex Inc.	27.75	0.00	0.0
PCs and Workstations						**OFF 0.92%**
OTC	7.50	3.00	Advanced Logic Research	4.38	0.13	2.9
OTC	43.75	24.63	Apple Computer Inc. (H)	41.00	-1.50	-3.5
OTC	33.00	10.38	AST Research Inc.	12.75	0.13	1.0
NYS	39.88	21.13	Compaq Computer Corp.	39.50	-0.88	-2.2
OTC	45.75	19.13	Dell Computer Corp. (H)	42.38	-0.94	-2.2
OTC	25.00	9.25	Gateway 2000 Inc.	22.88	0.00	0.0
NYS	98.88	70.13	Hewlett Packard Co. (H)	95.88	-1.00	-1.0
NYS	31.00	18.75	Silicon Graphics (H)	30.50	0.00	0.0
OTC	34.25	18.25	Sun Microsystems Inc. (H)	32.38	-1.13	-3.4
NYS	50.75	30.75	Tandy Corp.	44.13	0.25	0.6
OTC	6.00	2.38	Zeos International Lto.	5.13	-0.13	-2.4
Large Systems						**UP 1.73%**
ASE	10.50	4.63	Amdahl Corp. (H)	10.50	0.13	1.2
NYS	8.88	4.38	Convex Computer	7.63	-0.13	-1.6
OTC	3.00	0.50	Cray Computer	1.38	0.13	10.0
NYS	33.75	17.75	Cray Research Inc. (L)	19.00	0.50	2.7
NYS	11.00	6.63	Data General Corp.	10.38	0.75	7.8
NYS	38.63	18.25	Digital Equipment Corp.	30.63	-0.50	-1.6
OTC	6.38	2.38	Encore Computer Corp.	3.88	-0.13	-3.1
NYS	51.75	40.97	Harris Corp.	43.00	0.25	0.6
NYS	76.38	49.00	I8M (H)	72.88	-2.75	-3.6
OTC	18.75	7.50	NetFrame (L)	8.25	0.13	1.5
OTC	19.50	3.88	Parallan Computer	4.75	0.00	0.0
OTC	16.50	5.38	Pyramio Technology	10.25	-0.13	-1.2
OTC	20.00	11.13	Sequent Computer Sys.	19.75	0.75	3.9
OTC	6.84	3.25	Sequoia Systems Inc.	3.69	0.00	0.0
NYS	38.88	22.88	Stratus Computer Inc.	38.88	2.75	7.6
NYS	19.13	10.00	Tandem Computers Inc.	17.50	-0.38	-2.1
OTC	30.00	3.88	TriCoro Systems	6.88	0.50	7.8
NYS	16.50	8.63	Unisys Corp.	10.50	0.13	1.2
Software						**OFF 0.76%**
OTC	38.50	19.00	Adobe Systems Inc.	34.75	-1.00	-2.8
OTC	8.13	4.38	American Software Inc.	4.50	-0.38	-7.7
OTC	15.75	6.75	Ask Computer Systems	13.13	0.00	0.0
OTC	35.00	19.31	Autodesk Inc.	32.00	-2.25	-6.6
OTC	3.88	1.75	8achman Info. Systems	3.38	0.38	12.5
OTC	28.25	20.50	8GS Systems Inc.	23.00	0.75	3.4
OTC	71.00	40.50	8MC Software Inc.	46.25	1.00	2.2
OTC	33.00	22.50	8oole & 8abbage (H)	33.00	1.50	4.8
OTC	18.25	8.50	8orland Int'l Inc.	10.25	-0.13	-1.2
OTC	25.00	6.75	8rock Control Systems Inc.	10.00	-0.25	-2.4
OTC	4.00	2.38	CE Software	3.00	-0.09	-3.0
ASE	30.34	6.25	Cheyenne Software Inc.	11.13	0.25	2.3
OTC	16.13	8.50	Cognos Inc.	15.13	-0.38	-2.4
NYS	50.88	27.38	Computer Associates	47.50	-2.00	-4.0
NYS	5.38	2.50	Computervision Corp.	3.63	0.13	3.6
OTC	49.25	22.75	Compuware Corp.	38.25	-0.75	-1.9
OTC	14.25	9.00	Comshare Inc.	14.25	0.88	6.5
OTC	16.66	9.91	Corel Corp.	15.00	-0.81	-5.1
OTC	6.75	2.50	Easel Corp. (L)	3.00	0.13	4.3
OTC	29.25	14.25	Filenet Corp.	25.50	0.25	1.0
OTC	25.00	3.00	4th Dimension	6.75	-0.13	-1.8
OTC	18.00	8.13	Frame Technology	16.00	0.88	5.8
OTC	31.25	11.50	FTP Software Inc.	24.50	-0.63	-2.5
OTC	11.00	7.00	Group I Software	8.75	-0.38	-4.1
OTC	31.75	6.75	Gupta	10.75	-1.06	-9.0
OTC	11.50	5.13	Hogan Systems Inc.	6.13	-0.25	-3.9
OTC	39.75	18.00	IMRS (H)	37.50	-1.75	-4.5
OTC	39.75	11.25	Information Resources	15.50	1.13	7.8
OTC	28.75	14.25	Informix Corp.	25.50	-1.63	-6.0
OTC	11.25	7.75	Intergraph Corp.	8.38	-0.19	-2.2
OTC	8.75	2.50	Interleaf Inc.	4.38	0.50	12.9
OTC	18.00	8.25	Intersolv Inc. (H)	16.88	-0.50	-2.9
OTC	73.25	27.00	Intuit Inc.	68.50	-0.38	-0.5
OTC	18.75	2.25	Knowledgeware Inc.	3.75	-0.13	-3.2
OTC	34.75	19.00	Legent Corp.	30.13	0.88	3.0
OTC	86.50	29.75	Lotus Development	39.75	0.44	1.1
OTC	17.75	5.88	Magic Software Enterprises (L)	6.00	-0.25	-4.0
OTC	15.50	6.00	Manugistics Group Inc.	8.00	0.00	0.0
OTC	7.50	1.44	MathSoft	3.00	-0.13	-4.0
OTC	16.25	5.88	McAfee Associates (H)	16.25	1.00	6.6
OTC	17.25	9.38	Mentor Graphics	13.50	0.13	0.9
OTC	22.63	11.50	Micro Focus	13.88	-1.00	-6.7
OTC	11.63	4.63	Micrografx Inc.	5.63	0.31	5.9
OTC	63.75	38.25	Microsoft Corp. (H)	62.38	0.25	0.4
OTC	46.50	26.25	Oracle Corp.	44.13	-1.31	-2.9
OTC	40.75	21.50	Parametric Technology	34.75	-1.25	-3.5
OTC	24.50	13.38	ParcPlace Systems Inc.	19.38	-2.13	-9.9
OTC	66.75	26.00	Peoplesoft (H)	60.13	-4.63	-7.1
OTC	7.63	3.63	Phoenix Technologies (H)	7.50	0.06	0.8
OTC	69.50	32.00	Powersoft	65.88	2.88	4.6
OTC	29.75	3.50	Platinum Software	12.13	-1.00	-7.6
OTC	23.75	8.75	Platinum Technology	21.00	-1.88	-8.2
OTC	56.75	27.00	Progress Software Corp.	31.25	0.88	2.9
OTC	4.13	1.94	Quarterdeck Office Sys.	2.59	0.16	6.4
OTC	25.00	9.50	Rainbow Technologies Inc.	14.88	-1.50	-9.2
OTC	9.25	3.00	Rasterops	3.13	-0.75	-19.4
OTC	8.63	2.88	Ross Systems	4.31	0.31	7.8
OTC	28.63	2.38	Sapiens Intl. Corp. N.V. (L)	2.94	-0.19	-6.0
OTC	19.63	9.75	Softkey International Inc. (H)	19.63	1.25	6.8
OTC	8.63	3.00	Software Publishing Corp.	5.06	-0.56	-10.0
OTC	10.00	5.00	State of the Art	8.00	1.06	15.3
NYS	35.63	25.00	Sterling Software Inc.	31.50	0.50	1.6
OTC	19.88	3.63	Struct. Dynamics Research	4.38	-0.38	-7.9
OTC	57.00	33.25	Sybase Inc.	50.50	-2.25	-4.3
OTC	19.38	9.88	Symantec Corp.	17.50	-0.50	-2.8
OTC	50.75	33.00	SynOpsys	44.50	-3.25	-6.8
OTC	18.00	10.63	System Software Assoc.	12.88	0.75	6.2
OTC	6.75	3.25	Trinzic Corp.	4.63	0.25	5.7
OTC	30.00	11.75	ViewLogic Systems	21.75	-0.50	-2.2
OTC	23.25	12.25	VMark Software Inc.	16.63	1.50	9.9
OTC	13.25	6.25	Walker Interactive Systems	7.38	-0.13	-1.7
OTC	60.00	29.25	Wall Data Inc.	34.13	-2.13	-5.9
Semiconductors						**UP 0.71%**
NYS	31.75	16.75	Advanced Micro Devices	26.50	-0.13	-0.5
NYS	36.75	20.38	Analog Devices Inc. (H)	34.75	-1.50	-4.1
OTC	37.38	11.81	Atmel Corp. (H)	35.81	-0.31	-0.9
OTC	7.50	3.63	Chips and Technologies	6.00	0.25	4.3
OTC	44.63	24.88	Cirrus Logic	28.00	-1.50	-5.1
NYS	22.13	11.63	Cypress Semiconductor Corp.(H)	22.13	2.25	11.3
NYS	20.13	13.00	Dallas Semiconductor	14.00	-0.13	-0.9
OTC	29.25	14.75	Integrated Silicon Systems	26.00	1.25	5.1
OTC	73.50	55.88	Intel Corp.	61.25	-0.75	-1.2
NYS	43.50	13.25	LSI Logic Corp. (H)	43.50	2.13	5.1
OTC	20.13	12.25	Lattice Semiconductor	17.50	0.25	1.4
NYS	44.88	15.16	Micron Technology	40.00	0.25	0.6
NYS	59.75	42.13	Motorola Inc. (H)	59.75	1.88	3.2
NYS	25.00	14.38	National Semiconductor	18.00	0.75	4.3
OTC	16.25	6.75	Sierra Semiconductor	15.75	-0.38	-2.3
NYS	89.50	58.50	Texas Instruments	76.25	1.25	1.7
OTC	16.38	9.38	VLSI Technology	12.75	0.56	4.6
OTC	11.63	2.88	Weitek	3.50	-0.25	-6.7
ASE	20.38	7.75	Western Digital Corp.	17.63	0.75	4.4
OTC	59.75	29.00	Xilinx	55.75	-4.00	-6.7
OTC	40.00	26.50	Zilog Inc.	28.13	-0.88	-3.0
Peripherals and Subsystems						**OFF 0.29%**
OTC	30.50	14.50	American Power Conversion	17.75	-0.38	-2.1
OTC	27.25	18.25	8anctec Inc.	20.50	0.00	0.0
OTC	6.25	3.25	Cambex Corp.	3.63	-0.63	-14.7
ASE	5.88	1.88	Cognitronics Corp.	2.00	-0.13	-5.9
NYS	20.50	10.25	Conner Peripherals	12.75	1.00	8.5
OTC	24.00	9.75	Creative Technologies Inc.	13.88	0.00	0.0
OTC	14.00	3.50	Data Race Inc.	4.88	-0.38	-7.1
ASE	10.75	4.13	Dataram Corp.	4.81	-0.13	-2.5
NYS	23.00	12.38	EMC Corp.	21.50	0.13	0.6
OTC	11.50	3.13	Emulex Corp.	10.88	-0.13	-1.1
OTC	21.00	11.25	Evans & Sutherland (L)	11.38	-0.13	-1.1
OTC	23.31	14.00	Exabyte	22.63	0.50	2.3
OTC	28.50	2.63	Intelligent Info. Systems	3.25	0.00	0.0
OTC	4.50	2.00	Iomega Corp. (H)	4.06	-0.44	-9.7
OTC	9.75	3.00	IPL Systems Inc.	3.25	-0.19	-5.5
OTC	28.88	15.00	Komag Inc.	25.25	0.25	1.0
OTC	8.63	2.63	Maxtor Corp.	3.88	0.38	10.7
OTC	8.88	4.88	Micropolis Corp.	8.88	0.25	2.9
OTC	22.50	10.25	Pinnacle Micro Inc.	15.75	0.75	5.0
OTC	23.25	6.50	Printronix Inc. (H)	21.50	-0.50	-2.3
NYS	10.75	6.88	QMS Inc.	10.00	0.38	3.9
OTC	20.25	11.63	Quantum Corp.	16.00	0.50	3.2
OTC	18.25	7.38	Raoius Inc.	10.13	0.56	5.9
NYS	17.00	6.38	Recognition International	7.38	-0.13	-1.7
OTC	6.88	4.00	Rexon Inc.	5.13	0.13	2.5
OTC	28.75	18.63	Seagate Technology	26.88	1.44	5.7
NYS	41.50	25.00	Storage Technology	27.50	-0.50	-1.8
NYS	40.50	21.38	Tektronix Inc.	38.13	-1.13	-2.9
NYS	112.75	79.13	Xerox Corp.	102.25	-2.25	-2.2
Services						**UP 1.97%**
OTC	18.16	11.66	American Mgmt. Systems	16.25	0.08	0.5
NYS	4.25	2.50	Anacomp Inc.	2.75	0.00	0.0
OTC	20.50	14.50	Analysts Int'l	20.00	0.25	1.3
NYS	58.88	47.63	Auto Data Processing (H)	57.63	0.13	0.2
OTC	19.50	14.00	Cambrioge Tech. Partners (H)	18.00	-1.50	-7.7
NYS	27.50	17.50	Ceridian Corp.	26.00	-0.13	-0.5
NYS	24.25	17.25	Comoisco Inc.	20.75	0.38	1.8
OTC	15.50	6.50	Computer Horizons	15.50	1.00	6.9
NYS	47.13	30.66	Computer Sciences (H)	47.13	1.13	2.4
NYS	10.38	6.50	Computer Task Group	8.38	0.13	1.5
NYS	28.63	6.75	CompUSA Inc.	13.13	1.25	10.5
OTC	11.38	5.50	Control Data Systems Inc.	6.25	-0.25	-3.8
OTC	11.00	6.13	Egghead Discount Software	8.25	-0.38	-4.3
NYS	38.50	26.50	General Motors E (EDS)	37.25	0.63	1.7
OTC	21.00	7.25	Inacom Corp.	9.50	0.75	8.6
OTC	28.00	13.63	Intelligent Electronics	16.63	1.25	8.1
OTC	22.50	7.00	Merisel	9.63	0.25	2.7
OTC	32.50	9.25	Microage Inc.	11.88	-0.13	-1.0
OTC	40.50	28.50	Paychex	37.06	-0.69	-1.8
NYS	47.75	22.25	Policy Management Sys. (H)	47.13	1.13	2.4
NYS	28.25	19.75	Reynolos and Reynolos	25.63	0.88	3.5
OTC	28.50	17.00	SEI Corp.	20.25	-0.75	-3.6
OTC	30.63	21.50	Shared Medical Systems (H)	29.75	-0.75	-2.5
OTC	9.63	4.88	SHL Systemhouse	5.13	-0.06	-1.2
OTC	24.00	9.25	Software Spectrum Inc.	15.75	3.50	28.6
OTC	41.75	31.50	Sungard Data Systems	37.25	-1.25	-3.2

KEY: (H) = New annual high reacheo in perioo (L) = New annual low reached in period

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PowerBuilder 4.0 solid, no knockout

By Rosemary Cafasso
and Melinda-Carol Ballou

■ Despite months of anticipation, Powersoft Corp.'s newest release of PowerBuilder, scheduled for official launch today, delivers no knockout punches.

While beta users and observers last week said PowerBuilder 4.0 is a solid upgrade, most said there are no killer improvements.

"The big thing is it is stable," said John Robison, a software developer at TravelNet, Inc. in Sunnyvale, Calif., who is testing 4.0.

Upgrading woes

Last year, Powersoft had to ship a significantly improved update to Version 3.0 within several months of 3.0's release because of problems with the initial version. As recently as August, some users were seeking relief from system crashes, many of which resulted from PowerBuilder bugs in conjunction with Microsoft Corp. Windows' memory problems.

One of the most notable enhancements will be 4.0's support of additional platforms beyond Windows, including three flavors of Unix and the Macintosh platform. While the core 4.0 will ship next month, the multiplatform support will not be available until next year.

However, some of the more enterprise-class functions that some users had been expecting failed to show up in this release. Those features include application partitioning, integrated transaction management and a new three-tier architecture, which industry sources expect to be rolled out during the next year.

"I don't mind them scaling back on features — it's more important to add some features and focus on stabilizing the current code base," said Rich Finkelstein, president of Performance Computing, Inc., a Chicago-based consulting firm.

"A lot of 4.0 is [new] features and add-ins, but there are no whiz-bang ones," said Charles Snowden, manager of marketing information systems at Ciba Textile Products Corp. in Greensboro, N.C., which also beta-tested 4.0.

But Snowden and other users said plenty of the features will be useful.

Among 4.0's new features are the following:

- Data Pipeline, which provides a data replication function.
- Support for Microsoft's Object Linking and Embedding 2.0 and Open Database Connectivity (ODBC) 2.0.
- InfoMaker for Windows, an end-user data query application and new PowerBuilder component that combines and replaces two previous products, PowerViewer and PowerMaker.

Some developers spoke positively about the advantages of using PowerBuilder with the new version of subsidiary Watcom's database, which offers triggers and stored procedures. The also cited enhancements to PowerBuilder's Data Windows.

In the past, writing the functions to access and modify Data Windows was a "nightmare to use" and a major gripe of Ross Santos, a consultant at a health care provider in Sacramento, Calif.

PowerBuilder developers will no longer have to deal with those issues because of the Data Windows syntax provided in 4.0. "You now also can have multiple data windows on a report — [the reporting feature] was almost useless without that," Santos noted.

PowerBuilder 4.0 is scheduled to ship next month on Windows 3.1, Windows NT, and WinOS/2. PowerBuilder Enterprise for Windows costs $3,295; PowerBuilder Desktop for Windows is $695; PowerBuilder Team/ODBC costs $2,295; and PowerBuilder InfoMaker for Windows is $249.

PowerBuilder

CONTINUED FROM COVER 1

templates (see story above).

Second, the company said it is establishing a consulting service aimed at providing "best practices" programming techniques. The service will be offered as a two-week, $25,000 package to users.

"Powersoft has made programming pretty easy," said John Robison, a software developer at TravelNet, Inc. in Sunnyvale, Calif. "The problem is bad programmers can do a lot with PowerBuilder. If we could spend several thousand to make our application run twice as fast or train our people here, it would be worth it."

Making do

In the meantime, some users are counting on common sense to develop high-performance software. One example is an application developed at United Behavioral Systems, a managed behavioral health firm in Minneapolis that is a subsidiary of United Healthcare Corp. The software currently supports approximately 500 users and will soon add another 200, said Bo Swanson, development manager at United Behavioral Systems.

"We need to be able to scale the application to a large number of disparate users, and databases can grow very large over time, to 5G to 10G bytes," he said. His group used PowerBuilder as a front end, created a middle tier with Open Environment Corp.'s tools and then a third database layer using Sybase, Inc.'s relational database management system. PowerBuilder applications alone are currently two-tier and act as a front end that connects to the data server, Swanson said.

Other experienced PowerBuilder users applied their knowledge of the tool to optimize applications by going behind the scenes.

"We went behind the Data Windows [in PowerBuilder] to tweak the SQL based on our knowledge of the tables," said Toni Mitchell, a programmer/analyst at Chevron Corp. in Concord, Calif. "Some of the performance gains were significant when I eliminated certain table joins."

Ross Santos, a consultant at a Sacramento-based managed health care organization, is in the process of building an application with PowerBuilder that will ultimately support at least 2,000 users across 14 servers. He used his knowledge of PowerBuilder to put strict controls in place and optimize performance.

PowerBuilder tips

1. Create an internal PowerBuilder SWAT team to help users.
2. Enforce programming standards.
3. Set up informal code reviews by peers.
4. Start with a simple application if scaling up. Choose targets carefully and use disciplined code practices.
5. Developers can supplement PowerBuilder with middleware to create a three-tier architecture to help manage and distribute traffic.

Source: Corporate developers

For several users, training is increasingly a top priority.

Charles Snowden, manager of marketing information systems at Ciba Textile Products Corp. in Greensboro, N.C., said his firm is spending at least $20,000 to $25,000 a year to train PowerBuilder developers. Yet he said that figure is actually low because PowerBuilder is viewed as a development environment rather than just a desktop tool set.

Object projects

CONTINUED FROM COVER 1

object standards for building distributed systems and another to exchange health care industry information. The Healthcare Information Infrastructure consists of an $8.7 million and a $4 million grant, both extending over two years.

Veteran Chief Information Officer Paul A. Strassmann, former director of defense information at the Pentagon, said the NIST awards are a move by the Clinton administration to take a U.S. Department of Defense program in computer-aided software engineering and extend it to the entire government and beyond.

"This is hot news for private industry," Strassmann said. He added that the end product will be "a master tool set by which you will be able to preserve the knowledge investment — not just code, but requirements, designs and workflow."

All three of the federally backed programs will be based on Expersoft's implementation of the Object Management Group's Common Object Request Broker Architecture (CORBA).

Expected infrastructure for developing component-based software post-TRP

- Extended CORBA-compliant integration infrastructure
- Software component development tool set
- Component integration (megaprogramming tool set)
- Manufacturing resource planning extension — factory floor plan
- New-generation battle planning system

Source: ARPA proposal

Moving forward

But corporate users are hardly waiting for the federal seal of approval before bringing object technology to their production business systems.

While the ARPA and NIST awards indicate "very strong" government support behind CORBA, GTE Telephone Operations already has a major commitment to migrating toward the technology, said Michael Brodie, a systems architect at GTE Labs, a GTE subsidiary in Waltham, Mass. Brodie said his organization has major initiatives under way that will come on-line next year.

Sprint Corp. is also tremendously interested in distributed objects for managing its global network and already has prototype systems up and running.

John Strand, director of Sprint's technology planning and integration group, said the company has already shown the use of objects in its Magic test bed, one of six federally funded broadband networking test beds.

The prototype network management system, which entered testing in August, uses Expersoft's distributed object manager. "In a short amount of time, we're finding a high degree of success," said Strand, who plans to demonstrate the object-based network management system in December.

Standards bodies such as the ATM Forum are developing those network object types as well as interfaces between future object management systems and Simple Network Management Protocol-based network management systems.

One user contacted last week said the federal blessing is pretty much a non-issue. Of more interest is the time frame under which "players like IBM and Microsoft and Oracle and Novell articulate a strong commitment to this that's not smoke and mirrors," said Vi Beaudreau, director of advanced technology at ITT Hartford in Hartford, Conn. The insurer is just now setting up what it calls its Corporate Object Center.

"We're transitioning into building critical applications ... to support our core business of policy rating, issuing and so on," Beaudreau said.

An OMG vote stalls DCE's progress as a standard. See page 81.

Wysiwyg

Cyberface in cyberspace

Users with a color monitor can soon get cosmetics advice from their computer with Clinique's Cyberface, the New York firm's interactive guide to skin care and makeup. The product provides skin typing, color suggestions and a full product list and order form that can be printed and brought to any Clinique counter. Advice for men's skin care is also included so they can get tips in private. In December, Clinique will post a noncommercial skin care survey and its results on the Internet at ftp.uu.net, in directory/archive/published/clinique.

RoboHome

Home owners can throw away that television remote control and turn to their PC thanks to Home Automation Systems, Inc. The Costa Meso, Calif., company has released Ploto for Windows, software that, with the help of a special interface to the PC, can control lights, appliances, heating, audio/video equipment, watering systems and any other electronic device. No special wiring is necessary. Users manipulate icons representing the controlled devices on the screen and can schedule up to 128 timed events.

Analyst Translation Table

Statement	Meaning
Our product is undergoing an intense period of beta testing.	**The software doesn't work with the hardware.**
Our sales department has an international flavor.	**We just got a post office box in Toronto.**
We see the recession as an opportunity.	**I finally got to fire that jerk in purchasing.**
Our competitors serve the low end of the market.	**Our stuff is pretty darn expensive.**
We serve a very technically sophisticated end-user community.	**You need a B.S. in electrical engineering just to turn this on.**

SOURCE: *High Tech Joke Book*, OAK RIDGE PUBLIC RELATIONS, INC.

WYSIWYG compiled by Tim Ouellette

Illustration by David Marshall

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Inside Lines

Did they or didn't they?

Despite a high-level denial from Microsoft last week that any pact was consummated, Next Computer and the Windows maker were indeed *that* close to signing a mutually self-serving deal to port the NextStep environment to Windows 95 — the next version of Windows, according to a source close to Next. But Bill Gates stopped talks cold after Next CEO Steve Jobs leaked tidbits of the partnership to Wall Street, the source said. "Microsoft got mad that Next took the PR out from under them," the source explained.

An upside to protectionist trade policies?

Last week, Public Radio International's Marketplace program featured a new novel that tries to point out the benefits of the North American Free Trade Agreement (NAFTA) by describing what America might be like today if we hadn't practiced free trade in the past. In one example quoted from the book, Microsoft mogul Bill Gates ends up as an auto mechanic earning a modest wage — instead of the richest nerd in the galaxy. Some people might not view that as such a bad thing after all.

You scratch my back, I'll scratch yours (maybe)

Muckety-mucks from the Message-Oriented Middleware Association (MOMA) and the Open Software Foundation (OSF) are sizing each other up for a possible distributed computing mutual admiration society. So what if message queuing approaches and OSF's Distributed Computing Environment (DCE) are competing for much of the same market? The OSF is trying to get MOMA to use DCE's security and directory services, and the two organizations are also looking at working arm-in-arm to add messaging capabilities to DCE. They cautioned that the talks are "very preliminary."

You better not pout, you better not cry...

It's beginning to look a lot like Christmas. PerfectOffice, the application suite that WordPerfect announced in June and is slated to ship in September, is slipping toward November instead. Officials say the products work — they just haven't figured out how to make all of them install properly.

Slipped chips

Clone chip maker Cyrix could be slipping in its schedule to ship the M1 Pentium-class processor. According to sources briefed by Cyrix, it is unlikely to meet its second-quarter 1995 shipping goal for the high-performance chip. Analysts say the chip, which will have a size of about 380 mm, will be the largest in terms of real estate and will pack around 4 million transistors when it ships.

Don't you forget about us

Eleven large AS/400 shops, feeling a bit forgotten amidst all the client/server noise from IBM of late, got a requested meeting with Big Blue execs at the Common User Group meeting last month. While IBM didn't make much in the way of specific promises, it said it would consider giving multiple AS/400 configurations more weight as mainframe alternatives.

Make it so, No. 1

A high-ranking IBM official let it slip last week that Big Blue will announce a major deal this week with a large but unnamed European computer vendor to bundle the OS/2 Warp operating system into every PC it ships. So watch this space....

As part of a visit to L.A. last week, big-eared, philandering Prince Charles was given a look at The Global Schoolhouse Project, launched by the National Science Foundation last year. The program links schools in the U.S. and international classrooms across the Internet. Students from the city's poor neighborhoods got to hobnob with Charlie at the Beverly (Hills) Hilton. But if your tastes run closer to just regular folks, why not get in touch with Computerworld *about news items or tips? Call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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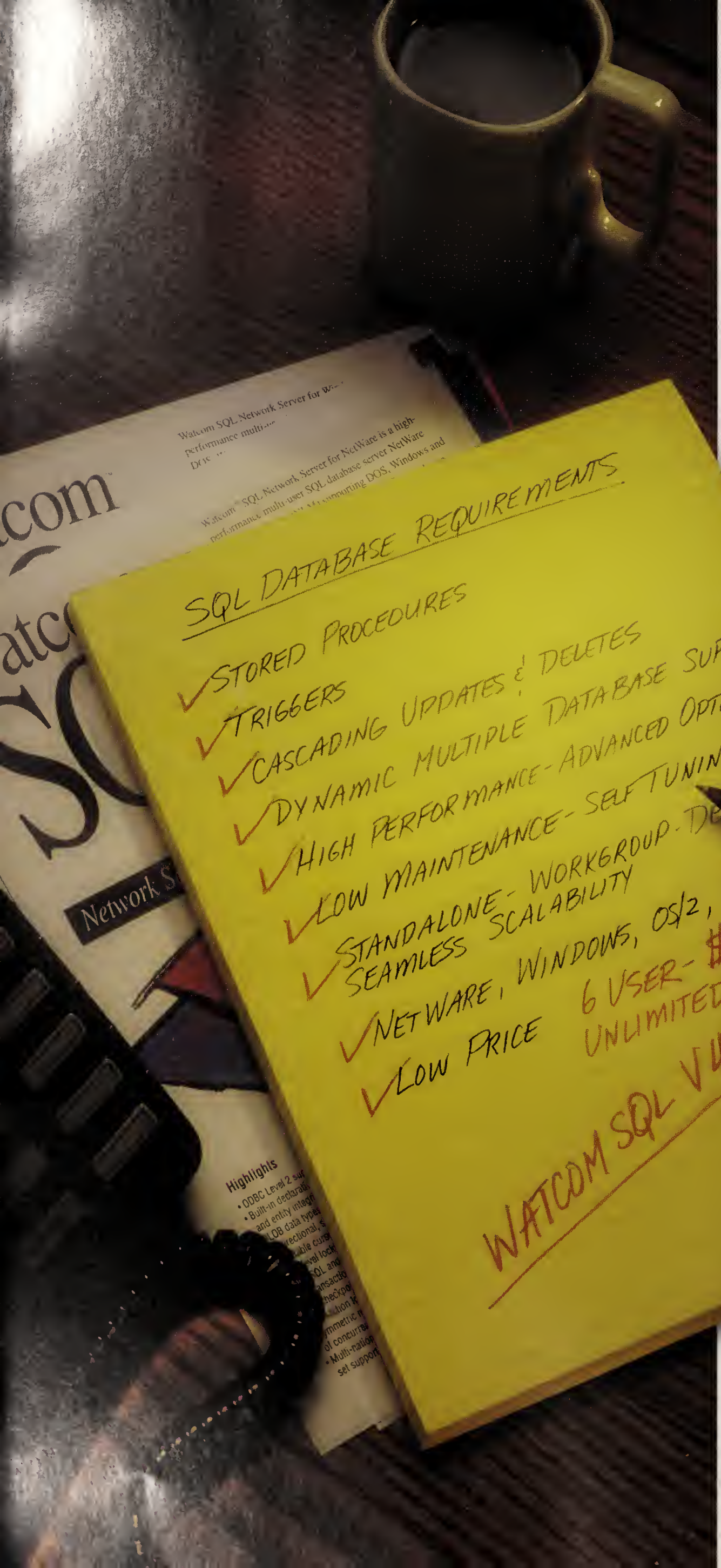

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